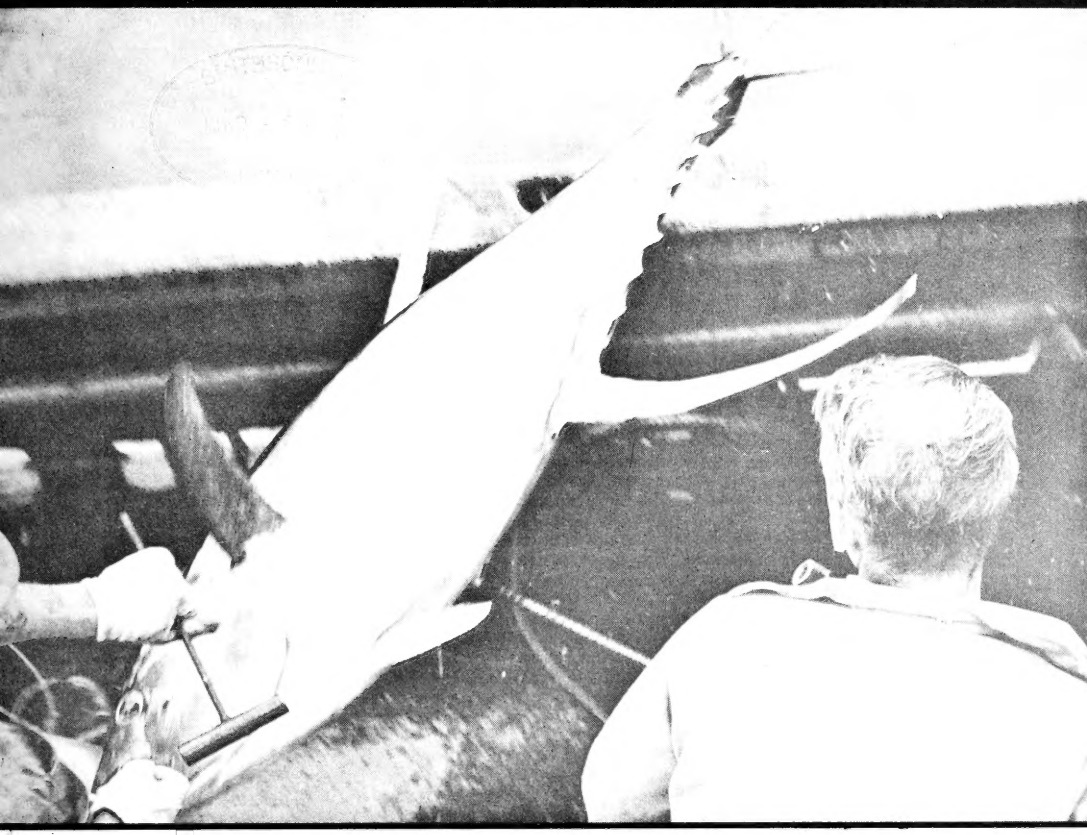
COMMERCIAL FISHERIES REVIEW



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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries
prepared in the BRANCH OF COMMERCIAL FISHERIES

A. W. Anderson, Editor
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Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Director, Fish and Wildlife Service, U. S. Department of the Interior, Washington 25, D. C.

The printing of this publication has been approved by the Director of the Bureau of the Budget, November 5, 1952.

CONTENTS

COVER: Hauling a 150-pound yellowfin tuna aboard the Service's exploratory fishing vessel Oregon. Exploratory fishing for tuna by the Oregon in the Gulf of Mexico has established to date that yellowfin are available in those waters at least nine months of the year. (See page 25 of this issue.)

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USE OF AN ELECTRICAL ATTRACTING AND GUIDING DEVICE IN EXPERIMENTS WITH A "FISH PUMP"

By Keith A. Smith*

SUMMARY

Results of fishing experiments using gear designed for pumping fish in combination with an electrical-guiding device and an automatic light dimmer show that, in calm waters, small herring (and probably other small phototropic fish) can be at-

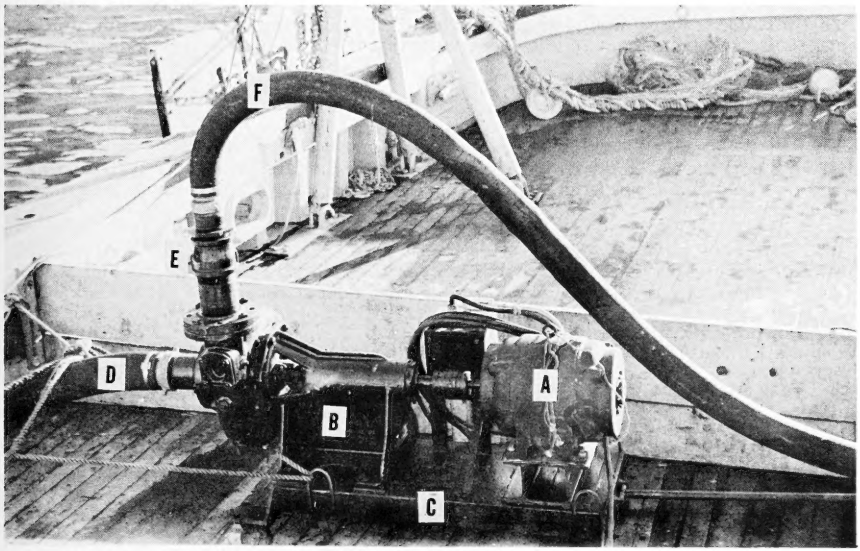

Fig. 1 - The "fish pump" used in the present and previous experiments.
A - Electric motor, 5 hp., 1,800 r.p.m., 3 phase, 60 cycle, 220 volts.
B - Pump, bladeless impeller type, 4-inch intake and outlet diameter.
C - Mounting carriage on rubber tire casters, secured with rope as shown.
D - Intake hose, 20 feet long, 4-inch inside diameter suction hose.
E - Pipe reducer, to reduce diameter from 4 inches to 3 inches (to prevent cavitation).
F - Discharge hose, 30 feet long, 3-inch inside diameter suction hose.

tracted and caught in a pump by use of a light for attracting them and a direct-current pulsating electric field for guiding them. These fish are not repelled at the outer fringe of the electric field. Instead, when attracted by the light they enter

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the field to a point where they involuntarily swim to the anode and are swept into the pump by the flow of water.

The gear took fish most successfully when both the underwater light and pulsating field were in operation. Small catches, however, were made using light alone. Sudden movement of the light and electrode assembly frightened the herring away. Thus, movement such as that caused by the rolling of the vessel prevented the herring from approaching the gear closely. Dimming the light did not cause herring to approach closer. The best catches were invariably made in the early morning during the approach of daylight.

Further work in attracting and guiding fish to a point of capture in the seas might be implemented by the use of light of the proper wave length and by sounds of proper pitch and intensity. More effective use of white light and an electrical field can be made by use of a better electrode design and a more stable support for the attracting and guiding assembly.

BACKGROUND

With gear designed for pumping fish from the sea, experiments were conducted aboard the U. S. Fish and Wildlife Service's exploratory fishing vessel John N. Cobb in the fall of 1952 (Ellson 1953). At that time some success was obtained using two 1,000-watt underwater lights to attract fish to the pump intake. A maximum of about 1,000 fish was caught in one night's operation of the pumping gear between the hours of 8 p.m. and 6 a.m.

Another series of tests was carried out using the same gear in combination with an electrical-guiding device and an automatic light dimmer during October and November of 1954. Since various workers have demonstrated that fish can be led to a positive electrode by a pulsating direct current (Applegate, et al, 1954), it was believed that this reaction of the fish to electrical stimulus might be used to lead them into the intake hose of the "fish pump."

Preliminary studies were made in the summer of 1953 on the conductivity of sea water and the pattern of electrical current flow through it. These studies, made by Duane Chadwick and Joseph Christie, graduate students in electrical engineering at the University of Washington, indicated that it was possible to produce with the amount of power available on the John N. Cobb the desired electrical current flow through a limited space of sea water. The work of Groody, Loukashkin, and Grant (1952) on the behavior of the Pacific sardine (Sardinops caerulea) in an electrical field was used as a basis for defining the necessary conditions of current flow and for calculating the power required to produce the desired effect on Pacific herring (Clupea pallasii).

GEAR

Approximately the same pumping arrangement was used as in the 1952 experiments. This consisted of a 4-inch bladeless-impeller pump coupled to a 5-horsepower electric motor as shown in figure 1. The pumping capacity was 220 gallons of water per minute. The intake hose was passed through a closed chock into the sea water, and the discharge hose was run to the receiving tank and firmly fastened.

The receiving tank was built on the after deck as shown in figure 2. This tank was 8 feet wide and 13 feet long and could be filled to a depth of approximately 10 inches when the vessel was in calm water.

Tests were made with various temporary lighting and electrical guiding arrangements. These tests indicated that both lighting and electrical guiding were necessary to lead fish into the pump intake. Without the light, fish were not attracted to the electrical field, and only those inadvertently entering the field were caught.

With the light on but with no electrical field applied, most of the fish that had been attracted to the light were able to escape. The water current near the intake was not so swift as to sweep a large number of fish involuntarily into the pump. On the contrary, when the fish felt the water current, most of them were able to swim against it and thus avoid being captured.

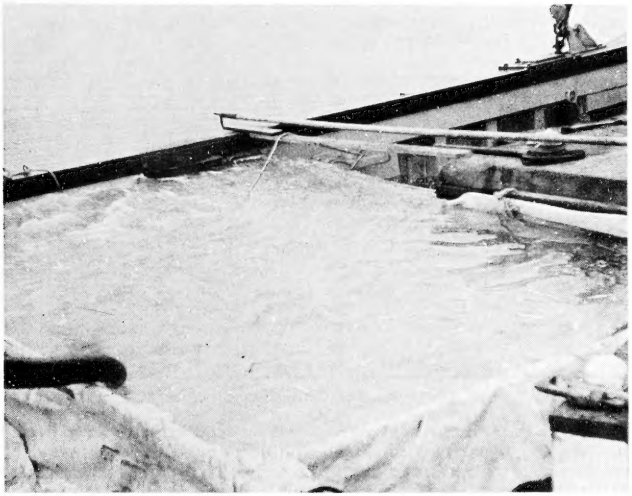

Fig. 2 - Receiving tank used to collect the fish which were pumped on board.

After these preliminary gear tests had been made, the arrangement of lighting and electrodes was designed as shown in figure 3. Four carbon plates $12\frac{1}{4}$" x $6\frac{1}{4}$" x $\frac{1}{4}$" were used as the positive electrode (anode). It was necessary to use carbon because the metals tested, including stainless steel, were rapidly disintergrated by electrolysis. Stainless steel, however, was found to be a suitable material for the negative electrode (cathode).

The anode assembly consisted of a funnel-shaped wooden box inside which the carbon plates were fastened. The small end of the funnel was attached to the intake hose of the pump (figure 3). Wires from the positive pole of the direct current generator were connected to the plates by brass bolts extending through the sides of the funnel. These bolts also held the plates in position.

The cathode was made of a 36-inch-diameter disc of stainless-steel wire screen. This screen, which had 20 wires per inch, was supported by a stainless-steel rod of $\frac{1}{4}$-inch diameter soldered around the circumference of the disc and by two 36-inch lengths of the rod soldered across the surface of the disc perpendicular to each other. Wires from the negative pole of the generator were attached at intervals around the edges of the cathode as shown in figure 3.

The anode assembly was mounted in a fixed position at one end of a 2" x 4" wooden support as shown in figure 3. The distance between the anode and the cathode could be adjusted from 0 to 10 feet by securing the cathode at various positions along the support. Lights could also be fastened to the support at any position along its length.

Power for electrical attraction was supplied by a 600-ampere d.c. welding machine. This machine was of a combination motor-generator type. It was driven by one of the ship's 220-volt, 3-phase, 30 kilowatt generators.

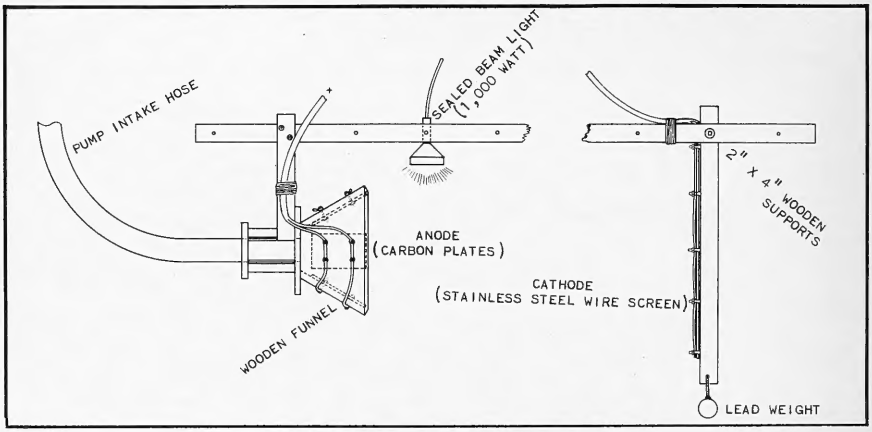

Fig. 3 - Diagram of electrodes and pump intake.

An electronic pulse generator was connected to the field circuit of the welding machine to produce a pulsating field. The pulse generator was operated by 110 volts a. c. from the auxiliary generator of the vessel and by 150 volts d. c. from the exciter of the welding machine. The rate of the pulsations could be varied from 3 to 13 per second, and the average current could be varied from 0 to about 600 amperes. This machine was never run at full capacity, however, owing to the high resistance at the anode and to the inability of the auxiliary generator to produce sufficient power. No provision was made for separating the pulses. Therefore, each pulse built up immediately after the preceding one dropped to zero current.

The above described method of electronically controlling the field was used to avoid the necessity of controlling and interrupting a high-intensity direct current mechanically, which would require elaborate and expensive equipment.

OPERATION AND RESULTS

With the fish attracting, guiding, and pumping gear, 29 tests were made in Puget Sound and off Cape Flattery. These tests were run for varying lengths of time. The tests in Puget Sound were made in areas in which schools of fish were indicated by feeding birds and by tracings of an echo-sounder. The tests off Cape Flattery were set "blind" in outside waters on Swiftsure Bank and in Mukkaw Bay.

The gear was put into the water at nightfall; the underwater light was turned on; and a watch was kept to observe any fish that rose to the light. The assembly was suspended in the water by a single cable from the boom at a depth of 5 to 15 feet, the whole apparatus lying in a horizontal position parallel to the axis of the boat. When the assembly was suspended at this depth, the reactions of the fish in the lighted space could be observed from the after deck if the surface of the water was relatively calm.

When a school of fish began to enter the field of light, the pump was started, and the electric pulse was turned on. Fish present between the electrodes within approximately 2 feet of the anode turned involuntarily and swam toward the anode. As these

fish approached to within 2 or 3 inches of the open end of the funnel, they became stunned by electrical shock and were carried into the funnel by the flow of water. Fish continuing to rise to the light were caught in the electrical field and led to the anode in this manner. Under ideal conditions of tide, wind, and availability of small herring, the fish rose up to the light and into the pump in a continuous stream.

At such ideal times, small 3-inch herring were caught at a maximum rate of 1,178 fish per minute or 70,720 per hour. The average rate of catch for the 5 best catches made on 4 different nights was 717 fish per minute or 43,022 fish per hour. Catches ranged from these values down to 0, the better catches always being made between 4 a. m. and 6 a. m. during the approach of daylight. The tests showing the best results are listed in table 1.

Table 1 - Data on Tests Made With Fish Pump and Electrical Attracting and Guiding Device[1/]

Place	Date	Depth	Duration	Lights (1,000 Watts)			Electricity			Catch		
				No.	Distance From Anode	Height Above Center of Anode	Pulses	Potential	Current	Number of Herring	Weight	Average Length of Herring
		Feet	Minutes		Feet	Feet	No. Per Second	Volts[2/]	Amperes[2/]		Pounds	Inches
Squamish Bay	10-28-54	8	60	1	1	1.5	9	77	85	687	-	3.5
	10-29-54	8	60	1	1	1.5	9	93	105	676	-	3.3
Friday Harbor	11-2-54	12	20	1	0	3	0	0	0	-	26.5	3.0
	11-2-54	12	30	1	0	3	9	97	85	-	25.25	3.0
	11-3-54	12	30	1	1	1.5	9	77	85	31,255	353	2.9
	11-4-54	15	30	1	1	1.5	9	77	175	35,360	331.5	3.1
	11-4-54	15	30	1	1	1.5	9	78	170	23,120	216	3.1
	11-5-54	6-8	60	1	1	1.5	9	78	170	19,200	204	3.0
Westsound	11-6-54	12	30	2	1 & 5	1.5 & 1.5	13	57	140	8,950	89.5	2.9
	11-6-54	5	46	2	1 & 5	1.5 & 1.5	Varied 6-13	Varied	Varied	2,850	28.9	2.9
	11-7-54	15	60	2	1 & 2.5	1.5 & 1.5	8	78	160	4,790	57.4	3.2

1/ These 11 tests shown here were made in the Puget Sound area; 16 other tests were also made in this area; and 2 other tests were made in the area off Cape Flattery. In all the tests for which data are not given, negligible quantities of fish were caught.
2/ Approximate average value.

The fish caught were predominately herring and, with the exception of 14 fish ranging from 6 to 8.7 inches in length, were all of a uniformly-small size. They averaged 3.05 inches in length and were in their first year of life as determined by scale analysis. Individual larger herring 6 to 7 inches in length were occasionally seen at the periphery of the lighted space at a distance of approximately 12 feet from the light. Only very rarely was a fish of this size caught.

The better catches were almost invariably made when both the light and electric pulse were in operation. In one test, however, 26.5 pounds of herring were caught in 20 minutes using only the light (table 1).

Small numbers of anchovies (Engraulis mordax) and eulachon (Thaleichthys pacificus) were caught along with the herring.

Gradual dimming of the light was tried in hope that the fish, particularly the larger ones, would rise nearer to the light as it became dimmer. Such a reaction was not observed, however, during the tests conducted. The herring seemed best attracted when the lamp was operated at its full brilliancy. Tests using more than one lamp, however, did not result in an increased catch.

The light could apparently be used at only one position to best advantage. The maximum catches were made when the light was placed 12 inches in front of the anode and 18 inches above the center of it. When additional lamps were used at other positions, catches were not increased.

A number of uncontrolled factors influenced the catch. The more important of these were (1) availability of fish, (2) presence of predators, (3) movement of the vessel caused by wind and tide (any movement of the light and electrode assembly, which was suspended from the vessel, frightened the fish), and (4) the changing time of day (herring were observed to approach the light in greatest numbers for a period of approximately 1 to 2 hours at daybreak).

As the fish came out of the discharge hose into the receiving tank, an estimated 60 percent of them were dead or dying. These fish were killed either by physical abrasion while coming through the hose and pump or by electric shock, or by both. It is likely that any fish that made a firm contact with the anode was electrocuted. Bruised and descaled areas were observed about the head and along the back of both live and dead fish.

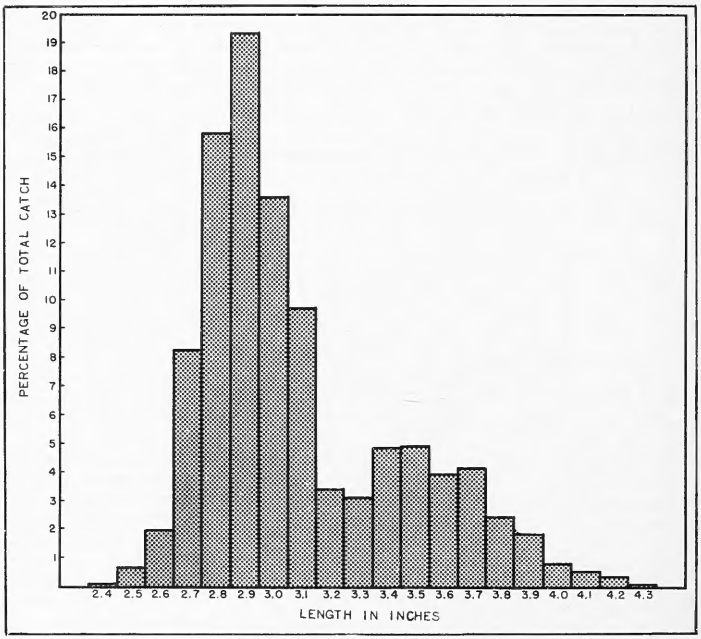

Fig. 4 - Length frequency distribution of herring catches.

No herring were observed in the outside waters off Cape Flattery, and the tests there were unsuccessful. Even if herring had definitely been present, however, the movement of the gear caused by the ocean swell and chop would probably have frightened them away. Hence gear of a different design should be tried if experiments on electrical attracting and guiding of fish are to be conducted in open ocean waters.

More experimental work is required before the method can be applied to catching fish on a commercial basis.

FIELD FOR FURTHER INVESTIGATION

The use of monochromatic lights to attract and guide fish to a point of capture might be tried. Experiments with various colors of light might lead to the discovery of a wave length that is much more effective than is white light.

The use of sound for fish attraction also presents a field for investigation. Sounds of the proper controlled frequency and intensity applied under water may result in the attraction of certain fish.

Knowledge is needed of the pattern of electrical current flow through an unlimited space of sea water, the amount of current per square inch necessary to guide fish of various sizes in sea water, and the optimum size and shape of, and distance between electrodes.

For work in the open ocean where the attracting and guiding assembly is subjected to the swell and the chop of the seas, a method of support must be designed which will leave the assembly independent of the vessel's motion. This support should also be designed to hold the assembly at a constant level in the water where it will be unaffected by movement of the surface of the water.

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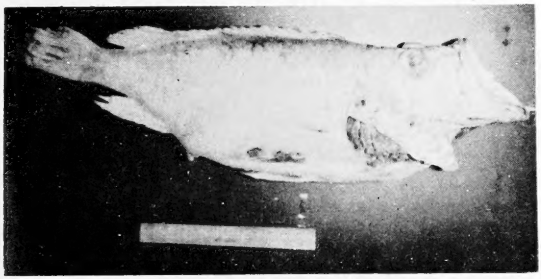
A GIANT OCEAN PERCH

A giant ocean perch was landed by a fishing trawler at Rockland, Maine, in January 1955. The fish weighed about 15 pounds and measured around $2\frac{1}{2}$ feet. According to the trawler captain, the fish was caught on the Grand Banks at a depth of 160 fathoms.



Giant ocean perch caught by trawler on Grand Banks. Foot rule at the bottom gives an indication of the size of the fish.

VITAMIN CONTENT OF FISHERY BYPRODUCTS

Part 2 - Vitamin B_{12} in Pacific Sardine (Sardinops caeruela) Organs and Riboflavin, Nicotinic Acid, and Vitamin B_{12} in Albacore Tuna (Germo alalunga) Organs

By Neva L. Karrick*

ABSTRACT

The report gives data on the distribution of vitamin B_{12} in the internal organs of the Pacific sardine and albacore tuna and also the distribution of riboflavin and nicotinic acid in the organs of the albacore tuna. Observations were made on the effect of the degree of freshness of the albacore tuna upon the vitamin B_{12} content of the organs.

INTRODUCTION

As knowledge of the role of fishery byproducts in animal feeds has increased, there has been a growing realization that the byproducts are valuable not only as an excellent source of protein but as a source of vitamins as well. Although information on the vitamin content of fishery byproducts are needed by the industry, surprisingly little data are available. In order to provide this information, investigations were undertaken at the Seattle Fishery Technological Laboratory on the vitamin content of fishery byproducts. The results of this study are being issued in a series of papers. Part 1 of this series reported the effect of processing methods on the vitamin content of solubles and meal (Karrick and Stansby 1954). The present paper (Part 2) contains data on the contents of certain vitamins in visceral organs.

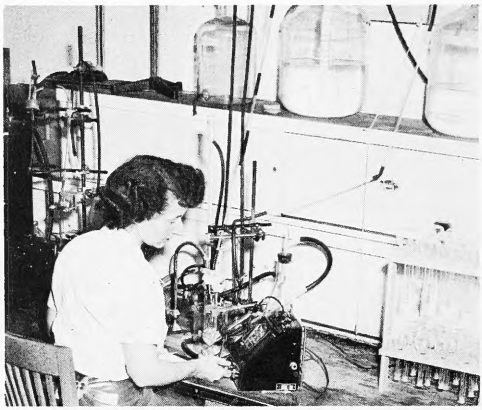


Fig. 1 - Titration carried out in the microbiological determination of B vitamins. The lactic acid formed during incubation of the extract from the fish samples with a lactobacillus organism is titrated to a definite pH measured with the pH meter. The amount of acid formed is proportional to the quantity of B vitamin present in the sample.

Fish viscera contain comparatively high concentrations of certain vitamins and consequently there has been an increasing interest in the distribution of these vitamins within the individual organs. Tarr, Southcott, and Ney (1950) found that in the various internal organs of salmon the kidney and the liver were highest in vitamin B_{12} content. Klungsoyer (1953) reported that the liver and the heart of Norwegian herring were rich in vitamin B_{12}, riboflavin, and nicotinic acid. Higashi and Hirai (1948) analyzed the liver of 14 species of fish for nicotinic acid and found that there was little variation within species in the nicotinic acid content of the liver. Other reports on the vitamin content of individual organs of fish were issued by Braekkan and Probst (1953); Hashimoto, Yamada, and Mori (1953); and Yanase (1952, 1953).

The present study was undertaken to determine (1) the vitamin

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B_{12} content of the visceral organs of Pacific sardine and in the whole sardine, (2) the riboflavin, nicotinic acid, and vitamin B_{12} content of the visceral organs of albacore tuna, 1/ and (3) the effect of the degree of freshness of the fish on the riboflavin, nicotinic acid, and vitamin B_{12} content of the tuna organs.

ASSAY METHODS

The vitamin assays of the organs were carried out by microbiological methods. The procedure of Roberts and Snell (1946) was adapted to determine riboflavin and nicotinic acid on samples of fishery byproducts and the procedure of Hoffmann, Stokstad, Hutchins, Dornbush, and Jukes (1949) was adapted for the vitamin B_{12} determination.

Riboflavin and nicotinic acid were extracted by the incubation of 1-gram samples with papain and takadiastase in pH 4.6 buffer at 37° C. Vitamin B_{12} was extracted by the addition of 25 milliliters of water to $\frac{1}{2}$-gram samples. All samples were then heated, with stirring, to the boiling point and allowed to stand $\frac{1}{2}$ hour before being filtered.

In each of the assays, the samples were run in duplicate at four levels. The growth of the organisms was measured by titration of the acid produced.

DISCUSSION

PACIFIC SARDINES: Two hundred Pacific sardines caught in December 1951 were frozen immediately after being landed at Terminal Island, Calif. They were then shipped to Seattle, Wash., where they were stored at -20° F. In January the dissection of 100 fish was started. They were thawed just enough to allow the separation of the organs. As these were obtained, they were combined according to kind and stored at 0° F. In March each group was thawed and blended, and assays of the resulting samples were started. Also at this time the remaining 100 sardines were ground in a meat chopper and thoroughly mixed. Samples were then taken for assay. Because the sardines were all from a single catch, a number of variables such as maturity of the fish and location or season of the catch could not be considered. Thus, the results are not to be taken as representative of all sardines.

Table 1 - Vitamin B_{12} Content of the Pacific Sardine Organs and of the Whole Sardine

Material 1/	Vitamin B_{12} Content
	Micrograms Per Gram (Wet Basis)
Kidney	1.48
Liver	0.43
Heart	0.35
Gonads	0.23
Spleen	0.095
Pyloric caeca	0.08 to 0.29 2/
Stomach	0.04 to 0.19 2/
Intestinal tract	0.02 to 0.09 2/
Whole sardine	0.17

1/ The organ samples were composites from 100 sardines; the whole-fish sample was a composite from another 100 sardines.

2/ The "apparent" B_{12} content is reported for these particular organs because results varied when different concentrations of extracts of the samples were assayed. Results obtained at a given concentration were in agreement but those obtained at different concentrations did not check.

Within these limitations, the results reported in table 1 indicate that the organs could be arranged in the following order with respect to decreasing vitamin B_{12} content: kidney, liver, heart, gonads, spleen, pyloric caeca, stomach, and intestinal tract.

ALBACORE TUNA: Seventy-three albacore tuna caught southwest of San Diego in August 1953 were divided into 3 lots, each of which was handled as follows: Lot A was held on deck 2 to 4 hours and then stored in ice for 2 days; lot B was held on deck 10 hours and then stored in ice for 4 days; and lot C was held on deck 26 hours and then stored in ice for 8 days. After the respective pretreatment periods the fish were frozen at -10° F. and stored for 6 days. They were then shipped to Seattle

1/ Germo alalunga, also known as Thunnus germo.

by refrigerated truck and stored at -20° F. In September the organs were removed from the fish, combined into groups according to kind and lot, and stored at 0° F. In June 1954 each group was blended and the assays for the riboflavin, nicotinic acid, and vitamin B_{12} contents of the resulting samples were started. The organs thus analyzed were liver, heart, spleen, stomach, and intestinal tract.

Table 2 - Riboflavin, Nicotinic Acid, and Vitamin B_{12} Content of the Organs of the Albacore Tuna

Organ	Lot	No. of Fish	Condition of Fish From Which Organs Were Taken	Vitamin Content		
				Riboflavin	Nicotinic Acid	Vitamin B_{12}
				. .(Micrograms Per Gram--Wet Basis) . .		
Liver	A	23	Fresh	7.6	55	0.89
	B	20	Slightly stale	7.3	52	0.84
	C	30	Stale	7.0	63	0.46
Average				7.3	57	0.73
Heart	A	23	Fresh	7.3	51	1.04
	B	20	Slightly stale	6.8	46	0.94
	C	30	Stale	7.1	40	0.81
Average				7.1	46	0.93
Spleen	A	23	Fresh	3.2	44	0.36
	C	30	Stale	4.6	72	0.37
Average				3.9	58	0.37
Stomach	A	23	Fresh	3.3	36	0.18
	B	20	Slightly stale	3.3	35	0.21
	C	30	Stale	3.6	47	0.21
Average				3.4	39	0.20
Intestinal tract	A	23	Fresh	1.6	48	0.13
	B	20	Slightly stale	1.7	49	0.10
	C	30	Stale	2.3	60	0.23
Average				1.9	52	0.15

The results are given in table 2. Within the limitations of the samples, the data indicate that riboflavin and vitamin B_{12} contents were highest in the liver and the heart and lowest in the intestinal tract. The nicotinic acid content was approximately the same in all of the organs.

The vitamin content of the albacore tuna organs were apparently not affected by the freshness of the fish.

An incidental observation is that the vitamin B_{12} content of the albacore tuna organs averaged $1\frac{1}{2}$ times that in the corresponding Pacific sardine organs.

SUMMARY

Within the limitations that the control of such variables as maturity of fish and location and season of catch were beyond the scope of the present study, the following conclusions may be made:

1. The organs of the Pacific sardine can be arranged in the following order with respect to decreasing vitamin B_{12} content: kidney, liver, heart, gonads, spleen, pyloric caeca, stomach, and intestinal tract.

2. In the organs of the albacore tuna, the riboflavin and the vitamin B_{12} contents are highest in the liver and the heart and lowest in the intestinal tract. The nicotinic acid content of the organs is approximately the same in all organs.

3. The contents of riboflavin, nicotinic acid, and vitamin B_{12} in the albacore tuna organs apparently are not affected by their degree of freshness.

ACKNOWLEDGMENT

The technical assistance of Mrs. Mabel A. Edwards is gratefully acknowledged.

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AMERICAN FISHERIES RESTRICTED TO UNITED STATES VESSELS

The American fisheries are restricted to vessels of the United States properly documented to engage in that trade, under the provision of section 251, title 46, United States Code. Except as otherwise permitted thereunder by treaty or convention, a foreign-flag vessel, whether documented as a cargo vessel or otherwise, is prohibited by such law from landing in a port of the United States its catch of fish taken on board on the high seas or fish products processed therefrom, or any fish or fish products taken on board such vessel on the high seas from a vessel engaged in fishing operations or in the processing of fish or fish products.

--Correspondence, Bureau of Customs, Treasury Department, Wash., D. C., May 21, 1954.

KEEPING QUALITY OF CHILLED DUNGENESS CRAB MEAT IN HERMETICALLY-SEALED METAL CONTAINERS

Investigations on the keeping quality of chilled Dungeness crab meat are being conducted in an attempt to evaluate bacterial spoilage by using organoleptic examinations, total bacterial count, and certain chemical tests. Such studies of both fresh and previously frozen non-heat processed crab meat held at 40° F. will provide helpful data for preparation of recommendations to the industry and for the establishment of government purchase specifications.

Table 1 - Comparison of Storage Life and Bacterial Count of Chilled Dungeness Crab Meat Held at 40° F.

Series	Type of Pack 1/	Initial Bacterial Plate Count 2/	Acceptable Storage Life at 40° F.	Bacterial Plate Count on Minimum 3/ Acceptability Date
		Bacteria/gm	Days	Bacteria/gm
1A	No vacuum. Held at 40° F. during approximately 20-day examination period.	1.7×10^5	5	1.4×10^7
1B	High vacuum (20 in.). Held at 40° F. during approximately 20-day examination period.	1.7×10^5	7	6.4×10^7
2	Medium vacuum (10 in.). Held at 40° F. during approximately 20-day examination period.	0.92×10^5	9	19×10^7
3	Medium vacuum (10 in.). Frozen storage for 5 weeks then held at 40° F. for approximately 20-day examination period.	8.7×10^5	7	5.0×10^7 (estimated)
4	No vacuum. Frozen storage for 5 weeks then held at 40° F. for approximately 20-day examination period.	180×10^5	2	1.5×10^7

1/ All samples were packed in double-seamed 6½ oz. C-enamel cans.
2/ Total bacteria count determined by method of Elliot, R. P., Commercial Fisheries Review, vol. 10, no. 11, November 1948, pp. 11-25.
3/ Date on which meat was still organoleptically acceptable prior to date on which meat became unacceptable.

Initial experimental work (Commercial Fisheries Review, Vol. 16, No. 11, November 1954, pp. 20-21) indicated that the storage life of chilled crab meat packaged dry in hermetically-sealed metal containers and stored at 40° F. was approximately 5 to 7 days. Three additional series of crab meat, packaged and stored under similar conditions, have been examined. The storage life of these series was 2, 7, and 9 days. There seems to be little correlation between the acceptable storage life (table 1) and the bacterial count of the crab meat on the day of minimum acceptability, as determined organoleptically. The degree of initial bacterial contamination seemed to follow a more definite pattern (table 1). The series with the lowest initial count had the longest storage life whereas the one with the highest initial count had the shortest storage life. This indicates simply that the cleanest crab meat keeps longer, which is already a well-known fact.

EFFECT OF BRINE FLOTATION

In many of the Pacific Coast crab-processing plants the picked crab meat is passed through a strong brine for the purpose of removing bits of adhering shell or other debris. A short study was made of the effect of this brining on the bacterial load of the crab meat. Samples were obtained at various intervals during a one-day period, prior to and after the brine wash. The bacterial counts show (table 2) that the load is reduced significantly after brining. This would seem to indicate that the strong salt solution is effective in washing away large numbers of bacteria as well as in removing the debris.

Table 2-Effect of Brining on Bacterial Load of Crab Meat

Time of Collection	Bacteria in Leg Meat		Bacteria in Body Meat	
	Before Brining	After Brining	Before Brining	After Brining
	Bacteria/gram	Bacteria/gram	Bacteria/gram	Bacteria/gram
8:00 A. M.	238,000	111,000	123,000	193,000
1:00 A. M.	1,070,000	266,000	4,180,000	170,000
4:00 P. M.	570,000	250,000	2,190,000	360,000

Note: Total bacteria count determined by method of Elliott, R. P., Commercial Fisheries Review, vol. 10, no.11, November 1948, pp. 11-25.

KEEPING QUALITY OF FRESH CRAB MEAT

In order to evaluate the keeping quality of the crab meat, it was necessary to rely on organoleptic examinations, since there are no common objective standards of acceptability based on either the bacteriological or chemical analyses. In the foregoing tests, odor and appearance were used to evaluate the quality of the product. The odor of fresh Dungeness crab meat, as it becomes less desirable, changes from a sweet crab odor to almost no odor, then to a strong crab odor which is still just acceptable. Finally when the odor becomes definitely tainted, unpleasant, and repugnant, it is judged unacceptable. In appearance, the moist, white, eye-appealing fresh meat becomes yellowish or gray as adverse changes occur.

Three series of tests have been completed in which organoleptic, bacteriological, and chemical examinations were made on fresh crab meat. The chemical examination included the determination of pH, total volatile nitrogen, and volatile reducing substances. The samples were obtained on different days from the same packing plant, packed in hermetically-sealed cans, held at 40° F. for about a 20-day period, and examined at frequent intervals. All show a similar pattern of adverse quality change. The bacterial counts rose sharply within the first few days and then leveled off for the remainder of the storage time. The pH values were erratic and showed no definite trend. The values for volatile base and volatile reducing substances showed a gradual upward trend until they reached the point at which the meat became unacceptable. At this point the values showed a rather sharp jump which was too late to be of value in indicating approaching spoilage. No determination to date, either bacterial or chemical, has been found which will in-

dicate imminent spoilage before it is obvious by organoleptic examination. Studies are continuing and include the effect of freezing and short-term storage at 0° F. on the keeping quality of the thawed meat at 40° F.

--Louise A. Carle, Bacteriologist, and
Lydiane Kyte, Research Assistant,
Fisheries Experimental Commission of
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* Operated jointly by the U. S. Fish and Wildlife Service and the Fisheries Experimental Commission of Alaska.

STUDY OF PHARMACEUTICAL AND OTHER INDUSTRIAL PRODUCTS FROM SALMON EGGS

Over 6 million pounds of potential fish oil were discarded as offal from Alaska salmon canneries this year. This loss of over a third of a million dollars in possible income from the oil alone is primarily due to the isolated location of the canneries, the short canning season, the highly perishable nature of the salmon waste, and the relatively low price brought by the crude fish oil.

Crude fish oil finds keen competition on the market from the tallow of the meat-processing industry and from cottonseed, soybean, and other vegetable oils. Prices of crude fish oils depend on those commanded by tallow and vegetable oils.

Previous investigations have shown that fish oils have special properties which could give them a decided marketing edge. Fish oils contain a high proportion of long-chain highly-unsaturated fatty acids. The fatty acids of salmon-egg oil, particularly, are very highly unsaturated. These highly-unsaturated fatty acids may offer unique possibilities as chemical building blocks for the preparation of commercial chemical products. Recent work at the Ketchikan, Alaska, laboratory has been directed toward determining the composition of the oil of pink-salmon (Oncorhynchus gorbuscha) eggs to provide the basic data for evaluating the raw material.

EXPERIMENTAL PROCEDURES

Pink salmon eggs were collected from the "iron chink" of a local cannery during regular commercial operations. The eggs were well developed but still in a tight skein, between 2 and 3 in the maturity scale of Davidson and Shostrom (1936). Oil was separated from the eggs using the warm-brine technique of Sinnhuber (1943). The ground eggs were mixed with warm brine, and the oil phase was allowed to separate then decanted and clarified by centrifuging.

The oil was converted to the methyl esters of the fatty acids by direct methanolysis using the procedure of Winter and Nunn (1950). Crystallization of the methyl esters from acetone at low temperatures yielded fractions of the fatty acid methyl esters of varying degrees of unsaturation. These fractions were vacuum-distilled in a packed column and the cuts from the distillation were analyzed for iodine value and saponification equivalent. From these data the fatty-acid distribution in the oil was calculated using the method of Hilditch (1941).

RESULTS

The component fatty acids of the brine-extracted salmon-egg oil are given in the table. The component acids of other competitive oils are also listed for comparison.

The pink-salmon eggs contained 13.2 percent lipid, determined by the acid hydrolysis method. Approximately $\frac{1}{3}$ of this lipid was separated as oil using the dilute-brine method. The extracted oil contained all of the coloring matter and was

Table 1-Component Fatty Acids of Several Oils

Fatty Acid	Pink Salmon Egg Oil	Menhaden Oil 1/	Tallow (Ox) 1/	Cottonseed Oil 1/	Soybean Oil 2/
	(Percent by Weight)				
C_{14} saturate	1.8	6.0	3.0	3.0	Trace
C_{14} monounsaturate	0.1	-	-	-	-
C_{16} saturate	8.3	16.0	29.2	20.0	9.7
C_{16} monounsaturate	5.1	15.5	2.7	-	0.4
C_{18} saturate	1.9	1.5	21.0	1.0	2.4
C_{18} monounsaturate	10.5	-	41.1	30.0	29.7
C_{18} higher unsaturate	20.8 (4.4H)	30.0 (4.0H)	1.8 (4.0H)	45.0 (4.0H)	56.9 (4.2H)
C_{20} saturate	-	-	0.4	1.0	0.9
C_{20} unsaturate	31.1 (7.3H)	19.0 (10.0H)	0.2	-	-
C_{22} unsaturate	14.7 (11.8H)	12.0 (10.0H)			
C_{24} unsaturate	0.2				
Unresolved	5.5		0.6		
Total	100.0	100.0	100.0	100.0	100.0

1/ Hilditch (1941) 2/ McLeod (1951)

Note: The numbers in parenthesis are a measure of the unsaturation and indicate the atoms of hydrogen required to completely saturate the fatty acids.

primarily the free-oil droplet in the egg. The oil contained less than 0.005 percent nitrogen. The yield on methanolysis was 102 percent.

DISCUSSION

The component fatty acids in the free oil in pink-salmon eggs contained a large percentage of fatty acids with 20 and 22 carbon atoms. These long-chain fatty acids were highly unsaturated, containing 3 to 6 double bonds. The low nitrogen content and high yield on methanolysis indicate the oil was primarily a fatty-acid triglyceride. The free oil, about $\frac{1}{3}$ of the total lipid in the egg, was easily extracted by this simple process: the ground eggs are mixed with warm brine and the oil phase allowed to separate then decanted and clarified by centrifuging.

The fatty acid distribution in the total lipid of the salmon eggs is currently being determined.

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--Robert M. Kyte, Chemist
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METABOLISM TRIAL TO DETERMINE COMPARATIVE NUTRITIVE VALUE OF FISH AND MEAT

On the Sunday evening (November 21, 1954) before Thanksgiving Day, 10 volunteer students on experiment ate their last test meal for this metabolism trial to determine the comparative nutritive value of fish and meat. All of them indicated they felt excellent after a test period of $7\frac{1}{2}$ weeks.

Prof. Pela Braucher, Head of the Department of Foods and Nutrition, College of Home Economics, University of Maryland, reported that the conditions of the test were much more rigidly controlled than in those of previous years. Three daily menus were devised which allowed only 10 grams of protein daily. This is about half as much protein as is contained in a single serving portion of fish or one-fifth the protein suggested by the National Research Council in its recommended daily allowances. These three menus were offered in rotation as the basal diet during the entire period. For breakfast the girls received fruit juice, dry cereal, heavy cream, bread, spread, and sugar. For lunch they ate soup or bouillon, saltines, fruit with maple syrup, gingerbread or date bar. For dinner they had Spanish rice and mushrooms and one vegetable, or bread and two other vegetables, fruit, heavy cream, and sugar. They also received daily a vitamin pill, a calcium phosphate product, and enough soft drinks or other low protein snacks to maintain their weight.

The last test-meal dinner meeting of the 10 volunteer students cooperating in a metabolism trial to determine the comparative value of fish and meat.

During nearly the first two weeks the girls did not get any fish or beef. The idea was to have their bodies supply the needed protein until they were in negative nitrogen balance. After they reached this stage half of the girls received at dinner an allowance of baked haddock and the other half an allowance of roasted sirloin of beef. The amount allowed was increased step-wise by about 10-gram portions of protein at 6- to 9-day intervals so as to determine the least amount of fish or meat that would satisfy the daily need for protein. This would be the amount that would stop the use of body protein for physiological purposes. Also every two weeks a blood sample was taken and analyzed for hemoglobin, red blood cell count, plasma protein content, and a few other indicators of metabolic status. A study was also started this year to determine if the rate of growth of fingernails was a good index of nutritional status. All of the girls had their fingernails photographed at three-day intervals under very exacting conditions. The rate of growth of the nails will then be correlated with analytical data on protein utilization for each girl and thus determine the value of the method.

The girls ate their meals with relish although at times during the early period of the trial they were almost too hungry to want to continue. When fish and meat were increased to at least a daily serving portion, the girls felt better and the extreme hunger subsided. They then enjoyed their meals and were satisfied to remain on test.

No information on data or conclusions are possible at this time since the metabolism trial was carried out so recently. There are many chemical determinations to be made that will take a long time to complete.

This metabolism trial was a part of the cooperative work of the University of Maryland and the Fishery Technological Laboratory, U. S. Fish and Wildlife Service. It was financed by funds supplied by the Maryland Agricultural Experimental Station, Bankhead-Jones Act funds distributed by the Committee of Northeast Regional Technical Workers in Home Economics, and the U. S. Fish and Wildlife Service.

--Hugo W. Nilson,
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Fishery Technological Laboratory,
Branch of Commercial Fisheries,
U. S. Fish and Wildlife Service,
College Park, Maryland

INTERIM FEDERAL SPECIFICATIONS FOR SHRIMP ISSUED

The Interim Federal specifications for Shrimp: Canned, and for Shrimp: Raw and Cooked, Chilled and Frozen were issued by the General Services Administration. These Interim Specifications were developed by the Technological Section of the U. S. Fish and Wildlife Service and the Quartermaster Food and Container Institute. Their use by all Federal agencies is recommended and they are authorized by GSA as valid waivers to Federal Specifications PP-S-311 and PP-S-316, respectively. These specifications will be converted to Federal Specifications after further coordination with industry and other Federal agencies.

BROILED BOSTON SCROD IS EASY TO PREPARE

Broiled Boston Scrod--as traditional with Bostonians as baked beans on Saturday night--is an easy-to-prepare fish dish which will please anyone who enjoys good food.

As featured in Boston's most famous eating places, scrod is simply small haddock fillets. Small haddock fillets, which average two or three fillets to a pound, are in particularly good supply and represent an economical and appetizing buy.

Here is a recipe for "Broiled Boston Scrod" recommended by the home economists of the Fish and Wildlife Service.

BROILED HADDOCK FILLETS

2 pounds haddock fillets
¼ cup butter or other fat, melted
1 teaspoon salt
Dash pepper

Sprinkle fillets with salt and pepper. Place on a preheated, greased, broiler pan about two inches from the heat, skin side down. Brush fillets with butter. Broil 5 to 8 minutes or until fish flakes easily when tested with a fork. Remove carefully to a hot platter, garnish, and serve immediately, plain or with a sauce. Serves 6.

Additions to the U. S. Fleet of Fishing Vessels

A total of 36 vessels of 5 net tons and over were issued first documents as fishing craft during November 1954--16 less than in November 1953. Virginia and California led with 6 vessels each, followed by Louisiana and Florida west coast with 5 vessels each, according to the U. S. Bureau of Customs.

Vessels Obtaining First Documents as Fishing Craft, November 1954 and Comparisons

Section	November		January-November		Total 1953
	1954	1953	1954	1953	
	Number	Number	Number	Number	Number
New England	-	1	22	19	20
Middle Atlantic	1	2	15	19	19
Chesapeake	7	3	91	76	83
South Atlantic	4	11	114	100	116
Gulf	13	24	306	236	264
Pacific	7	7	111	160	164
Great Lakes	-	1	5	7	7
Alaska	2	3	26	52	53
Hawaii	-	-	1	3	3
Puerto Rico	2	-	2	-	-
Unknown	-	-	1	-	-
Total	36	52	694	672	729

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

A total of 694 vessels received first documents as fishing craft during the first 11 months of 1954, compared with 672 during the same period in 1953. Over 60 percent of the vessels documented during January-November 1954 were in the South Atlantic and Gulf States where shrimp trawlers are the predominant type of craft operating.

California

TUNA TAGGED IN SOUTH PACIFIC ON COMMERCIAL CLIPPER "SOUTHERN PACIFIC" (Cruise C-3-54): A total of 1,014 yellowfin, skipjack, and big-eyed tuna

Tuna Tagged by California Biologists on Commercial Tuna Clipper Southern Pacific, by Species, September 2 to November 11, 1954

Area	Yellowfin	Skipjack	Big-eyed	Totals
	(Number of Fish)			
Galapagos Islands	15	9	33	57
Central America (Nicaragua & Costa Rica)	163	386		549
Peru (Gulf of Guayaquil)	80	328		408
Totals	258	723	33	1,014

were tagged by California Department of Fish and Game biologists on the commercial tuna clipper Southern Pacific off Central and South America (see table). The vessel sailed from San Diego on September 2, 1954, and returned to that port on November 11, 1954, covering the area of the Gulf of Guayaquil, Peru, Galapagos Islands, Costa Rica, and Nicaragua. All fish were tagged with type "G" plastic tubing tags.

Southern Pacific tuna tagging cruise (C-3-54), Sept. 2-Nov. 11, 1954.

During the cruise nine light stations were made while drifting at night. Very few of these stations yielded collections of any quantity. These collections are to be identified at a later date. When possible, samples of skipjack from Galapagos Islands, Central America, and Peru were measured for length.

It was discovered that a wet gunny sack placed over the forward part of skipjack and yellowfin aided materially in quieting the fish as they were being tagged in the cradle. The technique proved invaluable when used with skipjack, as 9 out of 10 fish would cease all movement the moment the sack was placed over the head.

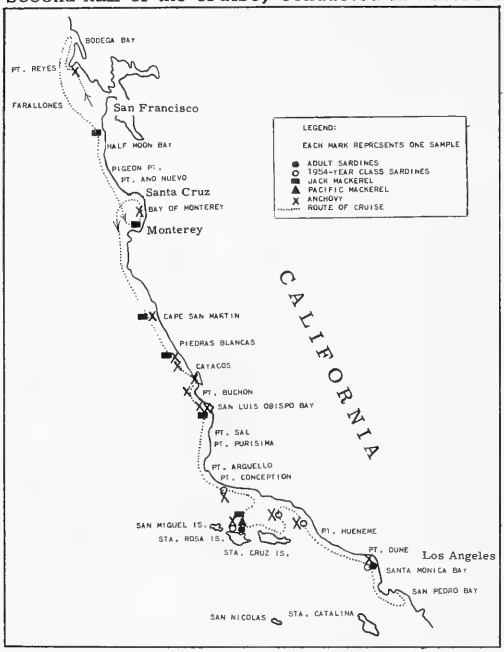
* * * * *

ANCHOVY CONCENTRATION SPOTTED OFF SANTA BARBARA BY "YELLOWFIN" (Cruise 54-Y-11): A very heavy concentration of fish was encountered by the California Department of Fish and Game research vessel Yellowfin in the Santa Barbara Channel between the eastern tip of Santa Cruz Island and Ventura, on a 23-day cruise completed at Los Angeles on December 5. Two light stations made in the school revealed that the fish which were attracted to the light were composed of approximately 90 percent northern anchovies and 10 percent 1954 year-class sardines. On the basis of "fathometer" tracings and observations on the "Sea Scanar," it was estimated that the vessel traveled over fish for a distance of 13.3 nautical miles. The "fathometer" tracings show that the fish in this school extended from the surface down to an average depth of nearly 100 feet.

This was the last of four 1954 survey cruises designed to assess the relative abundance of Pacific sardines, jack mackerel, Pacific mackerel, and northern anchovies from Magdalena Bay, Baja California, north off Central California. That portion of the Southern California coast from Goleta Point south to Huntington Beach had been surveyed on the previous cruise (54-Y-10), but it was felt that additional sampling in this area would be advantageous.

The Santa Barbara Channel area contained by far the heaviest anchovy concentration encountered on the cruise, but anchovies were sampled from Drakes Bay South to Santa Monica Bay. Jack mackerel were taken from Monterey Bay south to Santa Rosa Island and consisted entirely of fish less than one year old. The single Pacific mackerel sample, taken at Santa Rosa Island, was likewise composed solely of fish spawned in 1954.

The Yellowfin traveled a total of 535 miles while scouting for fish. During the second half of the cruise, conducted in waters south of Point Conception, rough weather hampered operations considerably. On the entire cruise 50 schools were observed (not including the enormous school of anchovies and young sardines in the Santa Barbara Channel). It was estimated that 6 of these contained sardines, 11 anchovies, 12 squid, 4 sauries, 3 Pacific herring, and 14 were unidentified. Some of these unidentified schools were probably composed of anchovies and young sardines. Surface temperatures, reversing thermometer casts, and bathythermograph casts were taken on all light stations where possible, regardless of whether or not fish were observed or taken in the blanket net.



M/V Yellowfin Cruise 54-Y-11, November 12-December 6, 1954.

A total of 63 light stations were occupied and hauls with the blanket net yielded 6 samples of sardines, 14 of northern anchovies, 6 of jack mackerel, and 1 of Pacific mackerel. Of the 6 sardines samples taken, 4 consisted entirely of fish born in 1954 and less than 127 mm. standard length. These were taken along the coastal area extending from Gaviota south to Santa Monica Bay, as well as at Santa Rosa Island and in the channel between Santa Cruz Island and Port Hueneme. Adult sardines were sampled at Santa Rosa Island and in Santa Monica Bay.

Surface temperatures throughout the cruise ranged from 11.4-16.3° C. (52.5-61.3° F.). The following table indicates the ranges in temperature and depth in which the primary species were taken.

Species	Temperature Range		Depth
	Degrees Centigrade	Degrees Farenheit	Fathoms
Anchovies	11.4-16.1	52.5-61.0	5-122
Juvenile sardines	11.4-16.1	52.5-61.0	5-210
Adult sardines	12.0-16.1	53.6-61.0	5- 12
Jack mackerel	11.4-13.8	52.5-56.8	5-122
Pacific mackerel	11.4	52.5	12

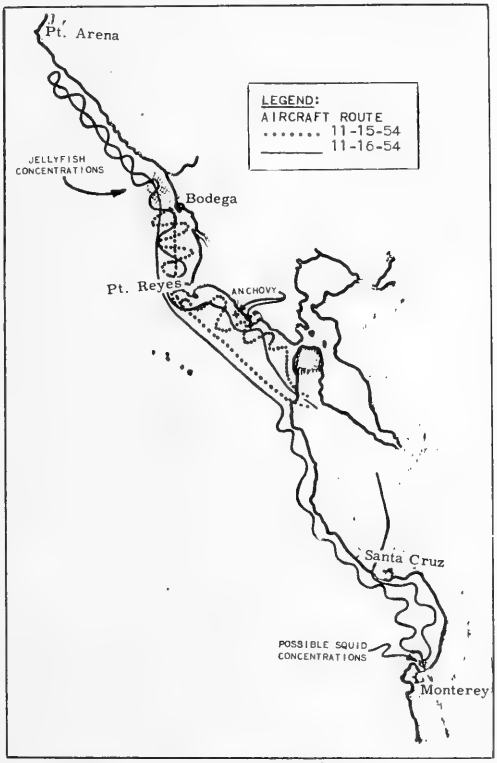
* * * * *

NO SARDINE SCHOOLS OBSERVED IN AERIAL-SPOTTING SURVEY (Airplane Spotting Flight 54-4): Only two schools of fish (possibly anchovies) seen near Bolinas Bay were the only schools located during an airplane-spotting-flight survey by the California Department of Fish and Game plane Beechcraft on November 15-16, 1954, off the California coast. During November 15 the inshore area from San

Francisco main channel north to Bodega Head was surveyed, and on November 16 the inshore area from Monterey to Gualala was covered. Aerial observation conditions were good and the total actual search time was $6\frac{1}{2}$ hours.

The survey was made to determine the coastal distribution and approximate abundance of pelagic species, with emphasis on the Pacific sardine.

Birds were observed off Point Reyes and Monterey in fair quantity, but were not working schools on either day. A large concentration of jellyfish was seen northwest of Bodega Head, covering an estimated five square miles. Dense concentrations of what were believed to be squid were observed immediately north of the Monterey breakwater.



Airplane Spotting Survey Flight 54-4 (Beechcraft 4758N), Nov. 15-16, 1954.

* * * * *

"FISH WEEK" IN SOUTHERN CALIFORNIA, MARCH 14-19: The launching of the First Annual "Fish Week" was announced by the Executive Director, Southern California Fisheries Association, at Los Angeles on January 10, 1955. The event will be celebrated March 14-19 this year, and will have the support of the fishing industry throughout Southern California.

Plans are now being made to publicize Annual Fish Week in all available educational channels by a Los Angeles Public Relations Counsel handling publicity and advertising for the affair.

It is anticipated by the industry that sea food and fish of most varieties will be in abundance this spring, and at favorable prices to attract the consumer.

Industry leaders will appear on radio and television to bring the story of Annual Fish Week to the public. A home economist of the Public Relations Counsel is preparing special fish recipes for the housewives of Southern California.

Federal Purchases of Fishery Products

FRESH AND FROZEN FISHERY PRODUCTS PURCHASED BY DEPARTMENT OF DEFENSE, NOVEMBER 1954: Fresh and frozen fishery products purchases for the military feeding of the U. S. Army, Navy, Marine Corps, and Air Force by the Army Quartermaster Corps in November 1954 amounted to 2,320,575 pounds, val-

ued at $935,093 (see table). This was an increase of 17.2 percent in quantity and 8.6 percent in value as compared with October purchases, and higher by 31.5 and 11.3 percent, respectively, than November 1953 purchases.

Army Quartermaster Corps purchases of fresh and frozen fish and shellfish during the first 11 months in 1954 totaled 23,284,337 pounds (valued at $9,579,928), lower by 8.4 percent in volume and 14.9 percent in value as compared with the similar period a year earlier.

Purchases of Fresh and Frozen Fishery Products by Department of Defense
(November and the First 11 Months of 1954 and 1953)

QUANTITY				VALUE			
November		Jan.-Nov.		November		Jan.-Nov.	
1954	1953	1954	1953	1954	1953	1954	1953
Lbs.	Lbs.	Lbs.	Lbs.	$	$	$	$
2,320,575	1,764,351	23,284,337	25,407,537	935,093	839,868	9,579,928	11,255,092

Prices paid for fresh and frozen fishery products by Department of the Army in November 1954 averaged 40.3 cents per pound as compared with 43.5 cents in October and 53.7 cents in November 1953.

In addition to the purchases of fresh and frozen fishery products indicated above, the Armed Forces generally make 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 establishments throughout the country.

Cans--Shipments for Fishery Products, January-October 1954

Total shipments of metal cans for fish and sea food during January-October 1954 amounted to 92,468 short tons of steel (based on the amount of steel consumed in the manufacture of cans), compared to 91,365 short tons in the same period a year ago.

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.

Fishery Products Marketing Prospects, January-March 1955

Markets for edible fishery products are expected to be generally steady during the first quarter of 1955, with a firmer tone anticipated toward the end of the quarter, according to the Quarterly Outlook for Marketing Fishery Products, January-March 1955, a report issued January 10 by the U. S. Fish and Wildlife Service.

As a rule, production of fishery products is lower in the first quarter of the year because of inclement weather.

In analyzing the general fishery situation for the current quarter, the report states that three relatively new products--fish sticks, frozen shrimp soup, and frozen oyster stew--are creating greater demand for groundfish, small shrimp, and oysters, respectively. Production of fish sticks reached about 50 million pounds in 1954 as compared to $7\frac{1}{2}$ million pounds for 1953 and negligible quantities in the previous year.

"If consumers exhibit the same demand for frozen shrimp soup as they have for fish sticks, the demand for small and tiny shrimp will increase manyfold. Frozen oyster stew may affect the market for not only fresh oysters but canned oysters as well."

The market for groundfish fillets will be fairly steady, with some slowness for small haddock fillets. A joint Government-industry promotion campaign which got under way was expected to improve the market for small haddock fillets by reducing current inventories to more normal levels. With the exception of pollock, the supply of groundfish fillets is liberal. Cold-storage holdings on December 1, 1954, were 67 percent higher than in the same period of 1953. Imports of groundfish fillets for the first 10 months of 1954 were well ahead of the comparable period in 1953.

A weak market is forecast for halibut because supplies are liberal but demand is moderate.

A firm market is anticipated for fresh and frozen and canned salmon. The supply of salmon is moderate and with little production expected during the first quarter, the demand will be active.

The market for canned sardines will be dull, with a moderate to liberal supply. The Maine sardine pack for the 1954 season was slightly under three million cases. Steady prices for this product are anticipated for the first quarter of 1955. The market for Pacific sardines will be unsettled due to the liberal supply of domestic-packed sardines and competition from imported sardines not-in-oil, primarily from Japan and the Union of South Africa. The absence of Pacific sardines from the domestic canned fish market for two years will affect the demand since other products have been substituted.

Canned tuna faces a dull market, with supplies liberal and demand moderate.

Both oysters and Dungeness crabs will be in full production on the Pacific Coast in the first quarter, but crabs on the Atlantic and Gulf coasts will be in light supply. Oyster production will decline in March along the Atlantic Coast but will show a firm market, with light supply and good demand. Oyster canneries on the Gulf Coast will be in full operation during the quarter.

The market for fresh and frozen shrimp will be unsettled due to heavy supply. Cold-storage holdings of shrimp hit a record peak of just under 33 million pounds on December 1, 1954. Imports for the first 10 months of 1954 were 6 percent ahead of the previous year's comparable period. Low prices are anticipated until stocks have been reduced.

For most varieties of fresh-water fish, the domestic supply will be light during January and February, with the market supplied principally by Canada. Supplies of whitefish and yellow pike will be light to moderate, and light for lake trout. Lake herring and sauger pike will be in liberal supply. With a generally lighter production during the first quarter, prices will remain steady for most species.

The fish-oil market will be firm with supply moderate and demand good. Total production of fish oil for the first 10 months of 1954 exceeded 18 million gallons, most of which was menhaden oil. Prices for menhaden oil have remained steady due to a better than average export market. Exports of fish oils in 1954 were 52 percent ahead of 1953.

The market for fish meal will be steady. Supplies are moderate and the demand will be good. The production of fish meal was average and the use of fish meal for poultry feed should be high, resulting in a healthy market.

Quarterly Outlook for Marketing Fishery Products, January-March 1955, Fishery Leaflet 336w, may be obtained free from the Division of Information U. S. Fish and Wildlife Service, Washington 25, D. C.

Great Lakes Fishery Investigations

FEWER CHUBS FOUND IN SHALLOW LAKE MICHIGAN WATER DURING FALL ("Cisco" Cruises X and XI): Chubs were not nearly so abundant in the shallow water (25 fathoms and less) of southern Lake Michigan during November and December 1954 as they were during the summer. This was the report of the Service's research vessel Cisco on two fishery and limnological survey cruises--November 12-20 and December 13-15, 1954.

On the earlier cruise the hydrographic transect between Grand Haven and Milwaukee was covered once each direction. Three hydrographic stations were occupied on each crossing and bathythermograph casts were made at 5-mile intervals. Experimental gill nets were set at 25 and 50 fathoms off Grand Haven. Experimental trawling was conducted off Grand Haven between $3\frac{1}{2}$ and 40 fathoms. An 8-hour intensive limnological and midwater trawling study was made off Grand Haven.

Twenty-eight burbot were taken in the gill nets set at 25 fathoms this cruise where an average of about one burbot per lift has been taken previously.

During the night of the intensive limnological study a large number of Pontoporeia was found at the surface. Mysis was most abundant in the 10- to 30-meter depth range, and few came to the surface. Small Coregonids and smelt were taken with trawls at the 6-fathom level (over a 40-fathom bottom) and a few larger Coregonids and a Cottus sp. were taken 13-16 fathoms down.

The epilimnion of Lake Michigan is continuing to cool steadily. Surface temperatures across the lake ranged between 52.3° and 55.4° F. at the end of Cruise IX (October 31). By November 12, they had fallen to between 48.6° and 52.7° F., and by November 16, they had dropped to 47.1-51.1° F. The lower limit of nearly homothermous water, which averaged 122 feet in depth on October 31, had descended to 126 feet by November 12, and to 132 feet by November 16. The upper limit of the thermocline is poorly defined. This zone of thermal change is thick (average thickness 55 and 58 feet during transects this cruise) and irregular in depth and form as the epilimnion has reached a temperature where there is less resistance to mixing with the near 40°-F. water of the hypolimnion.

All work on Cruise XI was done off Grand Haven. Operations included trawling at 12, 25, and 39 fathoms; gill netting at 25 and 50 fathoms; and hydrographic study at one station. Bathythermograph casts were made at the hydrographic station and at fishing locations.

A large catch of chubs, (Leucichthys artedii, L. zenithicus and L. alpanae) was made in gill nets at 25 fathoms. Nearly all fish were either in spawning condition or were freshly spawned out. Four burbot were taken in gill nets set at 25 fathoms indicating the continuance of an above-average abundance at this depth established during Cruise X. Bloaters (L. hoyi) were more abundant at a depth of 50 fathoms. There appears to be very few chubs (Leucichthys sp.) at 13 fathoms at this time, but yellow perch are abundant. During the summer and early fall the chub was very abundant at this depth.

The water of southern Lake Michigan is not yet homothermous from top to bottom in deeper areas. At 50 fathoms there was approximately a 5°-F. difference

between the surface and bottom temperature (44° F. at the surface and 39° F. at the bottom).

Gulf Exploratory Fishery Program

YELLOWFIN TUNA CAUGHT IN DECEMBER BY "OREGON" (Cruise 27A): A total of 25 yellowfin tuna were caught in the central Gulf of Mexico during December by the Service's exploratory fishing vessel Oregon, thus extending the season during which the vessel has taken yellowfin to 8 months. The yellowfin tuna were taken on 3 sets from 75-175 miles southeast of the Mississippi Delta on a 5-day cruise completed at Pascagoula, Mississippi, on December 17.

Boating a long-line caught yellowfin tuna aboard the Service's exploratory fishing vessel Oregon operating in the Gulf of Mexico. Note damage done by sharks.

Three long-line sets (average set consisting of 39 baskets of 10-hook gear) were made at positions 75, 175, and 80 miles southeast of the Mississippi Delta. These sets caught 9, 1, and 15 yellowfin tuna, respectively--a total weight of 2,780 pounds. In addition, 9 yellowfin were lost due to gear failures. Two wire leaders and 7 nylon gangions parted while trying to bring these fisn to gaff.

At the southermost set, where one shark-bitten tuna was caught, a larger number of white-tipped sharks (Pterolamiops longimanus) were observed around the vessel. Three sharks were caught on hand lines and one on the long line. At the other two stations no sharks were seen or caught and none of the tuna were damaged.

The yellowfin ranged in size from 82-164 pounds, and averaged 116 pounds each. Examination showed gonads of both sexes to be dormant at the time.

Two small schools of mixed blackfin tuna and white skipjack tuna were observed during the trip.

Approximate location of long-line stations fished by Oregon on Cruise 28. The number at each location indicates the number of yellowfin tuna caught.

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"OREGON" CATCHES 72 YELLOWFIN TUNA IN WESTERN GULF OF MEXICO (Cruise 28): A total of 72 yellowfin tuna (8,640 pounds) was landed by the Service's exploratory fishing vessel Oregon at Pascagoula, Miss., on February 1 after a 21-day cruise in the western Gulf of Mexico. This made the ninth consecutive month that

yellowfin tuna were caught in the Gulf. Very little trouble was encountered with sharks during the cruise--only four tuna were shark bitten. Nine long-line stations were made on a line between the Mississippi Delta and Tampico, Mexico. Fishing activities, in general, were greatly hampered by bad weather and eight scheduled stations could not be fished.

Yellowfin tuna were caught at all stations beyond the 1,000-fathom curve. One set close to the Mississippi Delta and one set off the Mexican coast in shallower water failed to produce yellowfin. The largest catch (17 yellowfin) was made in the vicinity of the Sigsbee Deep.

Originally it was planned to make several 100-basket (1,000-hook) sets on this cruise but due to bad weather the largest set made was 74 baskets. Also, strong currents encountered in the southwest Gulf required the use of the entire supply of swivels to keep existing gear fishing and little new gear could be rigged. Sets varied from 50 to 74 baskets with an average of 600 hooks per set.

On the return leg of the trip two trial drags were made in 200 to 500 fathoms with an experimental beam trawl. This trawl will be tested further on the next cruise.

Maine

SARDINE INDUSTRY APPOINTS RESEARCH DIRECTOR: The appointment of Dr. Berton S. Clark of Oak Park, Illinois, as Director of Research for the Maine Sardine Industry, was announced in a January 5 bulletin from that association. The well-known scientist will be employed by the Maine Sardine Tax Committee which had been negotiating for his services for several months.

The Committee, in cooperation with the Maine Development Commission, supervises an industry development program, financed by a 25-cents-per-case State tax imposed on all sardine canners.

Clark will direct and coordinate all industry research activities as well as work closely with other State, Federal, and private organizations on scientific projects designed to improve and develop sardine fishing and processing operations.

A retired research and scientific director of the American Can Company, Clark will maintain an office at that firm's laboratories in Maywood, Illinois, as well as at the industry's headquarters in Augusta.

The Executive Secretary of the Maine Sardine Industry stated that technological and biological research was becoming an increasingly important part of the Maine sardine development program.

Maryland

CHEASPEAKE BAY OYSTER INDUSTRY RECOVERS FROM HURRICANE DAMAGE: Hurricane "Hazel" had less effect on oysters in Chesapeake Bay than was first anticipated. While localized losses of oysters on certain bottoms have been severe, it appears that most of the major oyster bars have been only slightly damaged, if at all. A joint survey of bars in the open Bay and larger tributaries has been made by Federal and state scientists in cooperation with the Maryland Department of Tidewater Fisheries.

Few of the natural rocks examined showed any losses from the hurricane. Along the inner margins of certain exposed rocks where oysters had become established on bottom containing sand and on a few plantings made in shallow water, losses as high as 50 percent or more were apparent. There was also indication that oysters in exposed shallow water had been rolled about by heavy seas and, in a few cases, had been washed up on beaches. Such oysters, though still alive, are likely to show further mortality from the effects of being filled with sand or lodged in unfavorable positions. On the whole, however, the long established major oyster rocks have escaped major damage, and production from them continues, reports the November 1954 Maryland Tidewater News of the Maryland Department of Research and Education.

Typical hurricane destruction on Chesapeake Bay waterfront, October 15, 1954.

Hurricane damage to Chesapeake Bay shucking house, October 15, 1954.

While oysters typically were not fat at the opening of the season in September, they exhibited unusually good growth, so much so that many plantings which were expected to be harvested as "standards" in 1954/55 were yielding mostly "selects." A rapid fattening took place in the fall of 1954 as cool weather caused a mixing of the different layers of water that brings about rich blooms of the tiny plants upon which oysters feed. The result is that oysters were fat and in excellent condition. In addition, the Bay water was saltier than it had been for a number of years.

Rapid and efficient work was done in refloating damaged boats and in repairing shore installations that were wrecked by the storm. Many boats were driven far inland over marshes and had to be hauled long distances back to the water. In some instances special canals and channels were dug out to float the vessels. By November practically all of the oyster fleet was back in operation and the shucking houses were operating at near capacity. The picturesque fleet of sailing vessels which dredge oysters from the public bars of the Bay turned out in full force after the opening of the dredging season on November 1. Tongers were equally busy in the many tributaries of the Bay.

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CHINCOTEAGUE BAY OYSTER AND CLAM AREAS DAMAGED BY HURRICANE: Hurricane "Hazel," which did extensive damage on land, also caused trouble for the watermen of the Chincoteague Bay area of Maryland. The winds which rose to 93 m.p.h. in that area on October 15, 1954, created waves that did considerable damage to the oyster beds. In the lower part of the Bay, in the vicinity of Chincoteague, many thousands of oysters were buried, particularly in the Toms Cove area. In the lower Maryland section some were lost or carried by waves as much as a half mile from where they were planted and many beds disappeared, apparently covered during the storm, according to the December 1954 Maryland Tidewater News of the Maryland Department of Research and Education.

Some of the State-planted shells were also lost in this area, but the damage to them was light. Farther up the Bay from Girdletree to Public Landing the loss was greater as the wind had a longer sweep with no islands to break the force of the waves. In this area thousands of bushels of oysters were lost. Also, many were swept off the planted beds and carried some distance or scattered by the heavy seas. Many watermen report that they have not even found some of their planted beds; these were apparently covered with mud and sand. Those most damaged were near the Assateague Island side of the Bay where sand was picked up by the waves from the flats there and deposited in the middle of the Bay. Near Ocean City the damage was less as the Bay is narrower there and consequently the wave action was less. Minor losses occurred to oysters planted in this area. Some of the State-planted shells were covered by sand, but not over 20 percent of those in the area were completely lost.

Hard-shell clams did not suffer severe damage as far as can be observed. They are, of course, under the bottom and, unless covered very deeply, can survive. Some of the clammers report that the clams in some areas are deeper than usual. Although they were partly buried, they are still alive.

There was very little damage to boats in the area, boat owners having received ample warning. Most people put their boats up in the small creeks or in good harbors.

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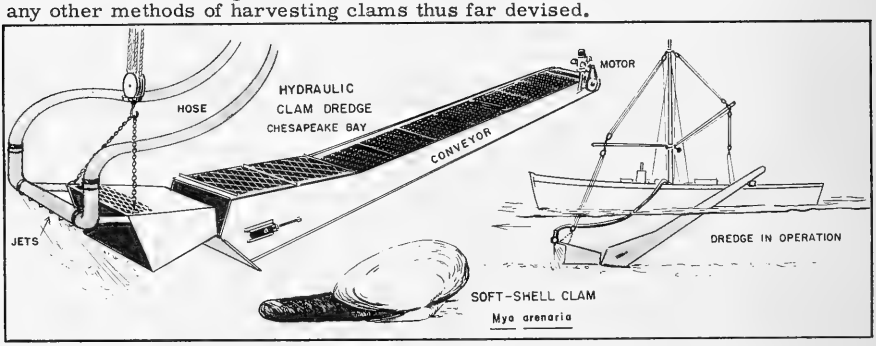
SOFT-SHELL CLAM DREDGE ALLOWS SUSTAINED PRODUCTION: During 1954 a number of conservation officials experienced in clam research and management, including representatives of the U. S. Fish and Wildlife Service, the Dominion of Canada, and the states of Maine and Massachusetts, observed the operation of the hydraulic dredge used in catching soft-shell clams in Maryland. All agree that it is an effective gear and a considerable improvement conservation-wise over any other methods of harvesting clams thus far devised.



In the New England-Canadian clamming area where hand-digging methods are employed, many clams of market size are broken and the high mortality rate of undersized clams represents a serious loss. An experienced and careful hydraulic dredge operator breaks not more than about five percent of the catch, and most of the clams that are missed by the dredge are able to rebury themselves in the bottom. Until the clams are completely "dug in" they are vulnerable to predators such as crabs and eels, and some loss undoubtedly occurs. However, if these clams were allowed to remain undisturbed in the bottom, in almost all areas natural mortality would claim 100 percent of the population, with no direct benefit to man.

The fear that Maryland's clam industry might be a "mining operation" based on long-accumulated stocks of clams, and therefore of short duration, appears to be

unfounded. Data obtained thus far indicate that Maryland clams grow very rapidly, reaching a length of 2 inches or more during their second year of life, and about 3 inches in the third year. Subsequent growth appears to be slow, and it is likely that relatively few clams survive more than 3 years. This is in sharp contrast to growth rates and longevity in more northern waters, where clams may require as long as 5 to 6 years to reach marketable size (2 inches). The apparently short life span of Maryland clams indicates that no great accumulation of stocks could occur.

The high growth rate, combined with adequate reproductive potential and moderate mortality rate, should result in rapid replacement of harvested stocks. There are indications that the growth rate of undersized clams is accelerated by removal of the larger clams. Observations indicate that, with the present method of catching and the enforcement of adequate conservation regulations, a given bed can be profitably harvested at least once a year.

In summary, all the evidence to date indicates that Maryland's clams are a replaceable resource, reports the December 1954 Maryland Tidewater News of the Department of Research and Education. It is difficult to estimate the potential magnitude of the industry, but its present value, approximately a half-million dollars gross income to dredge operators and dealers, is derived almost exclusively from operations in counties representing only about one-fifth of the total area of bottoms beneath tidewater.

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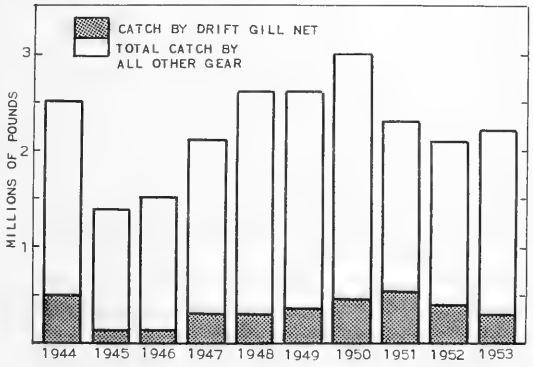
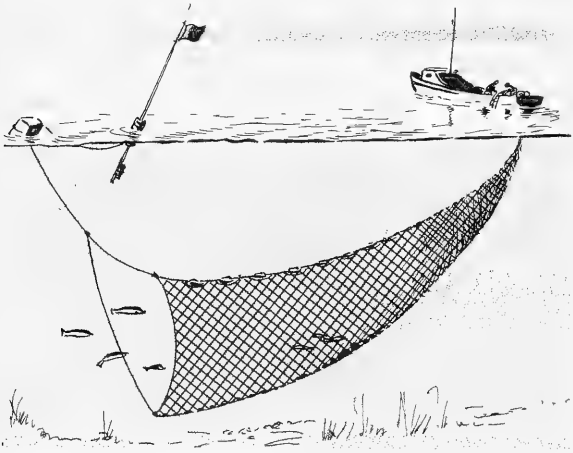
EFFECTS OF DRIFT GILL-NETTING ON STRIPED BASS STUDIED: Every year, with the onset of cold weather, Chesapeake Bay fishermen in many Maryland tidewater communities start overhauling their old drift gill nets and hanging new ones in preparation for the annual search for the schools of striped bass or "rock" that winter in the deeper areas of the Bay prior to their spring migration to the spawning grounds. Drift gill-netting is a highly seasonal operation, and is usually most profitable during January and February when boats range from the Chesapeake Bay Bridge to Point Lookout, following the schools as they feed on the small fish, worms, and shrimp-like animals sharing their winter habitat.



Drift gill-net catch of striped bass in Chesapeake Bay and tributaries, Maryland, winter months, 1944-53.

At the request of interested conservationists, sportsmen, and commercial fishermen, the Maryland Department of Research and Education has initiated a study of the drift gill-net fishery for striped bass in Maryland. The problem is designed to determine the effect of drift nets on the populations of striped bass in the Bay; how many fish are caught, when and where they are caught, and whether the catch per yard of net has changed during the past 10 years with the introduction of nylon netting. The study includes a critical analysis of all available catch statistics and field observations. Its success will be in no small measure due to the generous and helpful cooperation of commercial drift-net fishermen, according to the November 1954 Maryland Tide-Water News, a Department of Research and Education publication.

The study is not complete, but preliminary results show the drift-net fishery to be relatively stable. During the period 1944-53 the annual catches of striped bass by drift nets ranged from 162,000 to 523,000 pounds annually, with an average yearly production of 356,000 pounds, surprisingly close to the 1929 drift-net catch of 361,000 pounds. This average constituted approximately 15 percent of the total catch of striped bass by all types of commercial fishing gears used in Maryland waters.



Chesapeake Bay striped bass drift gill net.

A temporary increase in the amount of drift nets occurred during 1950 and 1951, accompanied by an increase in catch, followed in 1952 and 1953 by a decrease in both netting and catch. The best index to production is obtained from calculations of the catch per yard of netting. The catch per yard of drift net has remained relatively stable since 1947. During 1950 when striped bass were particularly abundant, large catches were taken in all commercial gears, and the total catch for all types of nets in Maryland exceeded 3,000,000 pounds. The drift-net catch per yard of net rose slightly during 1950 and continued to rise in 1951; obviously, fish were numerous and more available. Drift nets, like all gill nets, are selective in operation, catching fish of a size corresponding to the size of the mesh used, and generally are fished for the most plentiful size. For the most part small striped bass (rarely exceeding five pounds) are caught and, in general, drift nets, like stake and anchor gill nets, take smaller quantities of large striped bass than the other commercial gears.

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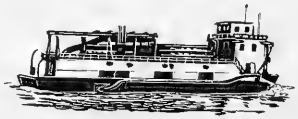
FISHERIES EXHIBIT OPENED AT SOLOMONS: An exhibit hall, recently opened at the Chesapeake Biological Laboratory, Solomons, Maryland, is now open to the public from Monday through Friday each week, according to the December 1954 Maryland Tidewater News, a Department of Research and Education publication. Life histories of the oyster, blue crab, and striped bass are shown through the use of mounted specimens, along with methods used to harvest these resources. A section is devoted to the methods used in taking an inventory of Maryland's various inland resources which are exemplified by game species, forests, and fresh-water fish. A special collection, for example, shows the life history and destructive nature of the shipworm. Fossils from the famous Calvert Cliffs fill an interesting case to illustrate animals that lived during a period of the earth's early development.



Michigan

"FISH WEEK," MARCH 13-19: The fishing industry of Michigan expects to put on "Michigan Fish Week" from March 13-19, 1955. The industry was assured by the Governor of Michigan and the Mayor of Detroit that proclamations would be issued establishing Fish Week and that every cooperation would be given the industry.

National Canned Salmon Week

A nation-wide canned salmon publicity campaign--National Canned Salmon Week--was featured with the Lenten season starting February 23 and extending through March 1, 1955. The Lenten season is traditionally recognized as "fish" season.

Trade publications, daily and weekly newspapers, radio, television, and other effective media were used to publicize and popularize canned salmon as a commodity. Some firms joined in with their own brand advertising. Cooperating were railroads, steamship lines, banks, and allied industries, such as can companies, lithographers, box manufacturers, oil companies, supply houses, and insurance companies. Nation-wide grocery chains, supermarkets, retail distributors, as well as wholesale grocers, cooperated by featuring canned salmon in their advertising and displays. Railroad dining cars, restaurants, hotels, cafeterias, and fountain and food service counters stressed canned salmon on their menus.

Publicity emphasized the economical nutritious food value of canned salmon as a concentrated, cooked, vitamin-rich protein food, "ready to eat right out of the can," or served in salads or hot dishes. Canned salmon is available in one-quarter, one-half, and one-pound tins for small families, for the after-school sandwich, for hors d'oeuvres, or for a TV snack. Salmon is also canned in the convenient and economical four-pound tins for restaurant and institutional trade, and school-lunch programs.

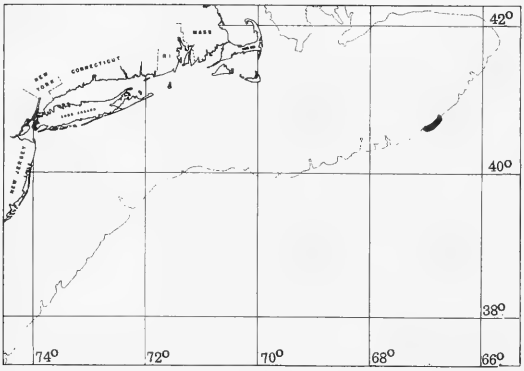
Canned salmon is produced from Eureka in California to the Yukon River in Alaska. The value of canned salmon produced in Alaska is far in excess of all the gold ever taken out of the Territory of Alaska.

New England Exploratory Fishing Program

DEEP-WATER TRAWLING TESTS ON GEORGES BANK BY "DELAWARE" (Cruise 1): A nine-day exploratory fishing trip in the deep waters of the continental slope on the southeast sector of Georges Bank was completed by the Service's exploratory fishing vessel Delaware at East Boston on January 13, 1955. This was the initial trip of a program designed to determine the extent of productive trawling grounds on the perimeter of Georges Bank, and trawling was conducted in depths of 150-230 fathoms.

Catches averaged 900 pounds per tow of one hour, with white hake, ocean perch, and gray sole accounting for the majority of the commercial species caught. Lobsters from 2 to 20 pounds were taken on most of the tows. A total of 24 egg-bearing lobsters was kept alive in circulating water tanks and delivered to the Massachusetts Division of Marine Fisheries for experimental tagging and release in coastal waters.

The most promising indication of haddock availability was noted on tow number 12, made at 40°41' N. latitude and 60°45' W. longitude in depths of 160 fathoms, where 5,000 pounds of red hake and 100 pounds of large haddock were caught.



Deep-water otter-trawl fishing on southeast Georges Bank by Delaware (Cruise 1), January 6-11, 1955. Dark area marks approximate location of trawling operations.

Small quantities of ocean perch were taken in 6 of the 12 tows. These were of a large size, with an average length of 15 inches and an average weight of 2 pounds each.

Fishing operations were carried out with a No. 41 standard otter trawl net, rigged with 10-fathom ground cables and a belly section of rollers. The area worked extended from 66°45' W. to 67°05' W. longitude and from 40°32' N. to 40°46' N. latitude. Tows were made in depths ranging from 150 fathoms to 230 fathoms, the maximum operating limit of the depth sounder. All tows were of 1-hour duration with length of towing wire in a ratio of 3 to 1. High winds and rough seas prevented fishing for 3 days and a total of 12 tows was completed in daylight-to-dark operations.

The Delaware was scheduled to depart East Boston on January 20 on Cruise 2, returning on or about January 28, 1955. On this cruise deep-water otter-trawl fishing at selected stations on the continental slope of southeast Georges Bank will be made to determine whether haddock, cod, ocean perch, or other bottom species are present in commercial quantities at this time of year.

Work will be conducted in depths from 150-230 fathoms in the area lying between the 100- and 500-fathom curves and bounded by 40°35' to 40°57' N. latitude, and 66°30' to 67°00' W. longitude.

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SHRIMP EXPLORATIONS IN GULF OF MAINE CONTINUED BY "DELAWARE" (Cruise 33): Small numbers of shrimp were caught in 13 of 22 drags made by the Service's exploratory fishing vessel Delaware in northeastern Gulf of Maine waters on an 8-day cruise completed at East Boston on December 15. The most promising indications of shrimp availability were found in the area between Cape Porpoise and the northeastern tip of Jeffreys Ledge, where tows in depths from 70-85 fathoms yielded 260 shrimp, plus a total catch of 1,700 pounds of ocean perch, gray sole, whiting, pollock, and hake. The shrimp averaged from 30-40 count per pound heads-on, and all specimens were in the egg-bearing stage. A tow made 12 miles north by west of Jeffreys Ledge Buoy in depths of 82-90 fathoms yielded 1,500 pounds of large ocean perch, and 500 pounds of mixed species, including pollock, hake, and whiting.

The primary purpose of this exploration was to ascertain if commercial quantities of shrimp were present in the area. Fishing operations were carried out with a standard No. 41 otter trawl, lined with 2-inch stretched-mesh cotton webbing in the belly and cod-end sections of the trawl. The 22 drags covered 6 potential shrimp fishing grounds located between Cape Ann, Mass.; and Monhegan Island, Me.

Other areas explored--east of Jeffreys Ledge Buoy, southwest of Monhegan Island, and southeast of Portland Lightship--resulted in negligible catches of shrimp and fish.

New York

NEW YORK CITY POSTPONES CRAB MEAT REGULATIONS ONE MONTH: In view of the active efforts of the states of Georgia and Maryland to enact sanitation laws, a 30-day grace period was granted on the effective date of the new crab-meat section of the New York City Sanitary Code, according to the Director of the Bureau of Food and Drugs, Department of Health for the City of New York. He stated the new crab meat section would become effective February 1, 1955. Meanwhile, the State of Georgia had qualified and was ready to meet the requirements of New York City. The Commissioner of the Georgia Department of Agriculture issued new rules and regulations for crab-meat plants in Georgia, effective January 1, 1955, and has taken steps to issue the necessary certificates.

The Chief of the Division of Food Control of the Department of Health, State of Maryland, has also been active and, with the help of crab packers in Maryland, it appears now that the Maryland Legislature will enact the necessary laws before the end of January. The Maryland Legislature began its sessions early in January.

Pacific Oceanic Fishery Investigations

LONG-LINE GEAR TESTED BY "COMMONWEALTH" ON COMMERCIAL TUNA CRUISE TO LINE ISLANDS (Cruise 2): Both steel and cotton long-line gear were used by the Pacific Coast vessel Commonwealth on a 15-day commercial fishing cruise near the Line Islands in November 1954. After only four days of fishing the crew had found the cotton line to be superior and used it for the remainder of the trip. Fishing was improved over the earlier trip of the Commonwealth to this area although the total catch was only about five tons of yellowfin tuna. The fish were small in size, each averaged about 80 pounds in weight.

The vessel was prevented from fishing longer because of an emergency call from a sailing vessel in distress, and the Commonwealth lost about two weeks' fishing time in order to tow the vessel to Fanning Island.

A great deal of difficulty was experienced with sharks which added to the inadequate amount of gear and the small size of the fish caught combined to account for the small catch.

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STEEL LONG-LINE TUNA GEAR TESTED BY HAWAIIAN VESSEL "MAKUA" (Cruise 3): Sea trials of "D" ring steel long-line gear were made and a shock absorber for steel-gear main line was tested on a three-day cruise by the Territory of Hawaii's research vessel Makua off Waianae. On this cruise, completed at Honolulu December 8, 1954, the vessel also watched for surface schools of fish in the vicinity of the long-line fishing region.

Twenty-four baskets of 11-hook 3-fathom dropper "D" ring gear were fished on 2 stations off Waianae. No serious difficulties were experienced in setting or recovering gear, but timing was slow due to the inexperience of the crew. The fish

catch consisted of 7 dolphin (mahimahi), 1 big-eyed tuna, and 1 shark. Close examination of the gear showed no signs of failure or fatigue. However, one dolphin taken on an end basket tangled 30 fathoms of main line so badly that 5 fathoms of wire had to be cut out and replaced.

Nylon droppers were tried on one basket of gear--$\frac{3}{16}$-inch nylon showed considerable elasticity. One fish was taken on a nylon dropper without injury to dropper or leader. However, nylon droppers were very difficult to coil neatly and proved hard to disentangle during the setting operation.

Fish watches were maintained whenever possible but very heavy rains limited the range of observation. No surface signs of fish were sighted on the cruise.

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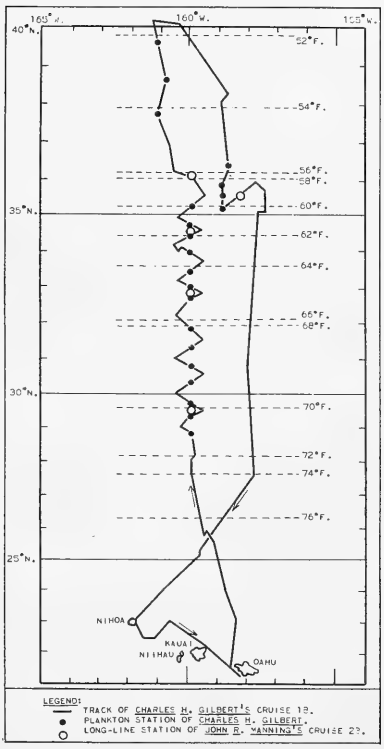
WATER CONDITIONS DETERMINE LOCATION OF ALBACORE TUNA IN MID-PACIFIC ("John R. Manning" Cruise 23, Part I and "Charles H. Gilbert" Cruise 18): Scientists with the Service's Pacific Oceanic Fisheries Investigations believe they can tell where albacore are located in mid-ocean from a study of the waters, and this was borne out by the results of a cooperative survey by the Service's research vessels John R. Manning and Charles H. Gilbert.



The two vessels explored waters north of Hawaii as far as 1,000 miles from the Island, and caught 21 albacore between 34° and 37° N. latitude along and east of 160° W. longitude. The vessels returned to Honolulu on December 21, 1954, from the three-week cruise.

Ocean conditions favoring the presence of albacore were found between 29° and 40° N. latitude, where plankton was more abundant than in the waters closer to Hawaii. Unfortunately, winds up to 40 knots and seas as high as 25 feet permitted only limited experimental long-line fishing on the John R. Manning, but even then, albacore tuna were caught on 3 of the 5 days. The two locations fished south of 33° N. yielded only 6 big-eyed tuna, but north of that latitude 21 large albacore tuna were taken, ranging from 50-85 pounds, at the three stations fished. In addition to the albacore and big-eyed tuna, 1 striped marlin, 31 great blue sharks, 1 thresher shark, and 29 lancet fish were caught.

The purpose of the survey was to determine the distribution and abundance of this commercially-valuable white-meat tuna species, and to describe the temperature and other characteristics of waters in which albacore were found. The John R. Manning fished with long lines and trolling gear, and operated a midwater trawl, a device used to estimate the abundance of the animals tuna eat. The Charles H. Gilbert trolled extensively, measured the amounts of nutrient chemicals in the sea water, and collected plankton, the minute animals that support the organisms on which the tuna

feed. Both vessels made frequent measurements of water temperatures down to a depth of 900 feet. In addition, a scientist from the University of Hawaii, accompanied the Charles H. Gilbert in order to measure the basic productivity of the microscopic plants that ultimately support all life in the sea. He did this by using a new technique which involves measuring the amounts of radioactive carbon taken out of the water by the plant plankton.

On a similar survey in September of 1954 considerable small albacore (15 pounds each) were taken at the surface by trolling, but on this later cruise intensive trolling from Hawaii to 41° N. caught no albacore. This drop in the apparent abundance of the smaller surface-dwelling fish perhaps reflects the onset of winter conditions in the North Pacific, for water temperatures were considerably lower than they were on the September cruise.

The John R. Manning fished 5 stations, 4 on 160° W. and 1 on 158°30' W. longitude. Sixty baskets of 13-hook gear were set at each station with the exception of the first, where only 55 baskets were set. Five- and 15-fathom float-line gear were alternated in each set by 5-basket groups. The main line on the 5 fathom gear was stretched during setting and the 15-fathom main line was set slack in order to fish in the widest possible range of depths. Bait used was sardine and herring, alternated every 10 baskets.

No great concentration of albacore was detected on any of the stations fished. However, 7 albacore were taken at each of the 3 stations north of 34° N. latitude. The albacore taken were generally large, ranging between 37 and 79 pounds with an average weight of 62 pounds. The fish were smaller on the northernmost stations.

According to the readings obtained from chemical sounding tubes, the deepest hooks of the 5-fathom gear fished at an average depth of 360 feet while the 15-fathom gear fished at 446 feet.

Trolling by the John R. Manning along the long-line set for 2 hours at each station resulted in no catch. Five surface lines were trolled at three stations, and one hour each of surface and deep trolling was done at two stations. Deep trolling was at a speed of 3 knots and surface trolling at 7 knots. In order to troll below the surface, the main line of $\frac{5}{32}$-inch wire was weighted with either a 50-lb. semi-depressor or a "kite-type" depressor. Four 10-fathom trolling lines were spaced 15 fathoms apart on the main wire. The depth of the lowermost line reached 300 feet, comparable to the fishing depth of the long-line hooks. Although no fish were taken trolling, 7 albacore were taken by long line at each of the two stations on which deep trolling was tried.

The John R. Manning recorded surface temperatures continuously and made BT casts at regular intervals. The subsurface temperature record obtained with the BT showed a uniformly deep thermocline along 160° W., the thermocline depth ranging between 200 and 420 feet. The recording thermograph, operated continuously during the cruise, usually showed a gradual decline in surface temperature but abrupt drops were noted at 33° and 36° N. At 36° N., there was a sudden drop from 60° F. to 57° F. within a matter of hours. A fishing station was occupied within this zone of abrupt change.

In addition, the John R. Manning occupied 3 mid-water trawl stations between the hours of 2000 and 2130, using the modified 6-foot Isaacs-Kidd trawl. The catch in each instance was very low in volume.

Stomachs were preserved from 7 albacore and 1 big-eyed tuna and the ovaries from 1 albacore. Field examination of the stomachs of 13 lancetfish revealed that most were either empty or contained only a few salps and polychaetes. A total of 13 albacore were tagged and released. Bad weather and sea conditions hampered execution of much of the planned work.

The Charles H. Gilbert made a reconnaissance survey of the hydrography and productivity of the "albacore zone" simultaneous with the long-line survey by the John R. Manning along 160° W. longitude and to the east of 160° W.

Seven lines were trolled by the Charles H. Gilbert during all daylight hours. The catch was only 3 dolphin taken at the southern end of the section, although one fish that may have been an albacore was lost at 36° N. in 58° F. water. This is in marked contrast to results obtained in September 1954 when surface albacore appeared plentiful in this region.

No surface schools or working bird flocks were noted except when traversing waters near the Hawaiian Islands, well south of "albacore water."

A dog-leg survey pattern covering a band of water between 159°30' and 160°30' W. was initiated at 28°40' N. This was discontinued at 36° N. because of bad weather. From 36° to 41° N. two parallel survey lines were completed that included the area originally designated for survey.

The Charles H. Gilbert found that surface temperatures were about 76° F. at 26° N., fell to 70° F. at about 29° N. and to 51° F. at 41° N. The rate of decline of the surface temperature varied; the most precipitous change being at 32° N. where it fell from 68° to 63° in about 30 miles. Generally, the decline was less rapid and characterized by a pattern of rises and falls of ½° to 1° that suggested imperfectly mixed water, perhaps taking the form of pools of warm water in cold, and cold in warm, though this was not true of zones of rapid change. These minor irregularities probably result from unequal cooling and varying wind stresses. (In this area winds may vary from 10 to 30 knots between localities 30 or 40 miles apart.)

A sharp thermocline was found between 26° and 36° N. (where the surface temperature was about 54° F.), though the isotherms comprising it were progressively cooler. Zooplankton hauls made during the survey suggested a larger standing crop north of about 33°, but the large and varying numbers of salps in the hauls made field evaluation difficult. Along with the appearance of large numbers of salps the water became somewhat greener and somewhat less transparent to the north.

The original plan for the Charles H. Gilbert anticipated making special studies to the east of 160° W. along with long-lining by the John R. Manning, but high seas and 30- to 40-knot winds prevented more than a slight eastward extension from 160° W.

Personnel Changes in Service's Fishery Statistics Programs

NEW HEAD IN NEW ENGLAND: Dwight L. Hoy, who has conducted fishery statistics surveys of the South Atlantic and Gulf States in recent years, has been transferred to the U. S. Fish and Wildlife Service's Branch of Commercial Fisheries, Gloucester, Mass., office to head the fishery statistics activities in the New England States handled by that office. He replaces C. H. Lyles, who has been transferred to New Orleans, La., to take charge of the Service's expanded fishery statistics activities in the Gulf area. The Gloucester office's address is Room 205, Post Office Building.

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NEW AGENT IN NEW JERSEY: Eugene A. LoVerde has been placed in charge of the U. S. Fish and Wildlife Service's Fishery Statistics office at Toms River, N. J. He replaces Russell Soulen who was recently transferred to the Service's

central office in Washington, D. C. Activities carried on from the Toms River office by the Service's Branch of Commercial Fisheries include the collection of monthly fish and shellfish catch data for inclusion in the monthly bulletin New Jersey Landings, and annual fisheries operating unit and catch statistics for that State which appear in various Service publications. The office's address is Post Office Box 143, Toms River, N. J.

Saltonstall-Kennedy Act Fishery Projects

FISHERIES ADVISORY COMMITTEE APPOINTED: The appointment of 19 representatives of all segments of the United States fisheries industries to the Fisheries Advisory Committee was announced by Secretary of the Interior McKay February 3. The Advisory Committee is authorized by the Saltonstall-Kennedy Act, P. L. 466 (83rd Congress), which was enacted to promote the free flow of domestic fishery products in commerce.

Those appointed are:

Moses Pike, Treasurer, Holmes Packing Co., Eastport, Maine.
James S. Carlson, Treasurer, Baker, Boies and Watson, Boston, Mass.
J. Richards Nelson, oyster and clam grower and dealer, Madison, Conn.
David Hart, independent fisherman and vessel owner, Cape May, N. J..
Harold R. Bassett, Treasurer, C. A. Loockerman, Inc., Crisfield, Md.
George R. Wallace, President, Wallace Fisheries Co., Morehead City, N. C.
Harry F. Sahlman, Sahlman Seafoods, Fernandino Beach, Fla.
Leon S. Kenny, Owner, Pinellas Seafood Co., St. Petersburg, Fla.
Alphonse J. Wegmann, President, Mexican Gulf Fisheries, Inc., Coden, Ala.
Lawrence W. Strassburger, Strassburger Inspection Service, New Orleans, La.
Earl Buist Webster, fisherman and vessel owner, Twin City Fishermen's Cooperative Association, Port Isabel, Texas.
Emmett Concannon, Vice President and General Manager, W. M. Walker, Inc., Chicago, Ill.
Arthur Sivertson, Sivertson Brothers Fisheries, Duluth, Minn.
Donald P. Loker, Vice President, Star-Kist Foods, Inc., Terminal Island, Calif.
Arthur H. Mendonca, President, F. E. Booth, Inc., San Francisco, Calif.
Thomas F. Sandoz, President, Columbia River Packers Association, Astoria , Oregon.
Mark L. Edmunds, independent fisherman, Garibaldi, Oregon.
Lawrence C. Calvert, President, San Juan Fishing and Packing Co., Seattle, Washington.
Jack Mendenhall, Manager, Ketchikan Cold Storage Co., Ketchikan, Alaska.

Under a provision of Public Law 466 the Secretary of the Interior was authorized to appoint a group of experts from the domestic fisheries and fishery products industry to advise him on industry problems embraced by the new legislation.

The Saltonstall-Kennedy Act makes available to the Secretary of the Interior each fiscal year an amount equal to 30 percent of the gross receipts from customs duties collected on imported fishery products to conduct fishery research and to develop and increase markets for fishery products of domestic origin.

The law provides that expenditures from this special fund not exceed $3,000,000 in any fiscal year, and that the balance in the fund at the end of each year shall not exceed $5,000,000. In prior years only $175,000 a year was allocated from customs duties for domestic fishery industry research and development by the Department of the Interior.

Secretary McKay said the research programs authorized by the new law have long been urgently needed to conserve and develop one of the Nation's most important natural food resources.

"The authorization for the appointment of this Industry Advisory Committee," McKay said, "further implements the Administration's partnership policy of working closely with the people most vitally affected toward the solution of common problems."

The Fish and Wildlife Service which administers Public Law 466 has allocated $2,204,500 to urgent projects thus far this year.

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FISHERY PRODUCTS STANDARDS CONTRACT LET: A contract to develop quality, condition, and grade standards for domestic fishery products has been signed by the U. S. Fish and Wildlife Service and the National Fisheries Institute, Secretary of the Interior McKay announced January 10. The contract provides for the expenditure of not more than $30,000, the work to be completed within one year.

Under the contract the Institute will conduct a research project to determine current marketing practices of packers and distributors of fresh and frozen fish and shellfish products. The Institute will then designate the products and areas requiring immediate attention; establish liaison between the fishing industry and the Fish and Wildlife Service; and form advisory groups composed of industry representatives.

Given a satisfactory set of voluntary standards, a system of inspections and certifications would be made available to interested members of the fishing industry and its affiliated interests. The Fish and Wildlife Service believes that this would result in uniformly higher quality products and more orderly markets.

This project is being financed by funds provided by the Saltonstall-Kennedy Act, P. L. 466 (83rd Congress).

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SERVICE EXPANDS FISHERY STATISTICS PROGRAM: The fishery statistics activities of the U. S. Fish and Wildlife Service's Branch of Commercial Fisheries were expanded recently through allocation of funds under the Saltonstall-Kennedy Act, P. L. 466 (83rd Congress).

Gulf of Mexico Shrimp Statistics: The collection of detailed shrimp statistics in the Gulf of Mexico has been expanded. C. H. Lyles, who has had wide experience in the collection of fishery data in the Gulf States has been transferred to New Orleans to take charge of the expanded program. He is located in the Custom House, 423 Canal Street, New Orleans, La. During the past two years Lyles has been stationed at Gloucester, Mass., where he was in charge of the activities of the Statistical Section in the New England States.

Tampa, Fla.: A statistical office for the collection of fishery data was opened recently at Tampa, Fla. Activities of the Tampa office will include obtaining detailed data on landings of shrimp in the Tampa area, as well as the collection of general operating unit and catch statistics for that area. Until permanent quarters are obtained in Tampa, the address is Post Office Box 505, Largo, Fla. Herbert Munger, who has had wide experience in Federal fishery work and in the fishing industry, is in charge of that office.

Great Lakes Office at Ann Arbor, Mich.: A fishery statistics office was recently opened at Ann Arbor, Mich., to handle the collection of statistics on the commercial fisheries of the Great Lakes and the Mississippi River States. A suboffice will be opened later in La Crosse, Wis., and a Fishery Marketing Specialist will also operate out of the New Orleans office to cover the Lower Mississippi States. Alfred A. Swanson, who was formerly stationed at Beaufort, N. C., was recently trans-

ferred to Ann Arbor to take charge of the new office, which is located at 1220 East Washington Street, Ann Arbor, Mich.

Astoria, Ore.: A Statistics and Market News Service suboffice has been opened at Astoria, Ore., for the collection of daily landings of fish and shellfish and ex-vessel prices for the Astoria area. Eino Edward Poysky was recently appointed to the Fishery Marketing Specialist position set up for that area. Landings and ex-vessel prices for the Astoria area will be published daily in the "Fishery Products Report" issued by the Seattle Market News Service office.

Poysky will also assist in the collection of monthly and annual fishery statistical data for the entire State of Oregon.

The Astoria suboffice, located at 212 Fisher Building, 176 11th Street, will be operated by Poysky under the supervision of Charles M. Reardon, Fishery Marketing Specialist in charge of the Seattle Market News office.

South Carolina

BIOLOGICAL RESEARCH AT BEARS BLUFF LABORATORIES, OCTOBER-DECEMBER 1954: Oyster Studies: Setting intensity of oysters studied in the vicinity of Bears Bluff, South Carolina, indicates that in 1954 oyster setting began a few days later than previous years, and that the intensity of the set was slightly lower. Oysters continued to set with recordable intensity (4 spat per shell face) until the middle of October, a recent report from the Bears Bluff Laboratories points out.

Growth and mortality studies on individual oysters carried on during October-December 1954 indicate that for small oysters (under 2 inches in length) the period of maximum growth occurred during the first part of the quarter from October 6 to November 9, while the minimum growth occurred from November 10 to December 13. This is not unexpected since water temperatures during October-November averaged 70° F. while during November-December the average water temperature was 60° F. This initial study, which is being continued, simply indicates that South Carolina oysters apparently fit the general pattern as outlined by investigators in other Southern states, who have found that the optimum temperature for oysters is between 60° and 70° F.

New Shrimp Discovered: It is of scientific interest, even if of no commercial value, that a shrimp new to South Carolina has been found recently. On October 18 three specimens of a relatively small shrimp (about 2 inches) were taken in an experimental trawl. The shrimp were found on mud bottom in 16-18 feet of water off Kiawah Island. Two of the specimens were lost before the research boat returned to the Laboratories, but the single remaining specimen was identified as Hippolysmata (Exhippolysmata) oplophoroides (Holthuis). The shrimp is too unusual to have a common name. It was originally described in 1948 from specimens taken at Surinam, South America. Specimens have also been taken off the Cape Fear River, N. C., and off the coasts of Georgia, Texas, and Brazil.

New Research Vessel: On November 8, 1954, the South Carolina Wildlife Resources Commission secured from the Department of the Army, a 65-foot T-boat for the use of the Bears Bluff Laboratories. This vessel will be used to continue the study of shrimp and trawling operations in offshore waters. Present plans also include some exploratory fishing.

In the 1930's the Pelican of the U. S. Bureau of Fisheries (now Fish and Wildlife Service) made some 100-odd experimental trawls off the South Carolina coast.

For the past two years the Theodore M. Gill, operating out of Brunswick, Ga., under the U. S. Fish and Wildlife Service, has on 9 ocasions visited 20 stations off the South Carolina coast to plot currents and make biochemical analyses of water samples. There have also been other scientific investigations made off the coast by various branches of the Federal Government. However, since the area from the edge of the continental shelf to the shoreline and from the North Carolina boundary to the Georgia boundary contains some 9,000 square miles, obviously considerable exploratory and research work can be done in this area before any of the activities overlap. Most of it is a vast unknown so far as fisheries resources are concerned. Just how much of it Bears Bluff Laboratories can undertake remains to be seen, but the new vessel gives an opportunity for some exploratory work in this region.

Many fishermen believe that there are unknown populations of shrimp existing off the coast. Many believe that there are areas off the coast not now fished, which would yield large catches of finfish. It is known that various species of tuna, a commercially-desirable snapper, mackerel, bluefish, and other game and commercial fishes at times occur abundantly off the South Carolina coast.

Actually, practically no work has been done with the T-boat since its arrival. Most of the time has been spent in converting it to research use and installing necessary gear such as a "fathometer," Loran, and various other hoists.

U. S. Foreign Trade

IMPORTS OF GROUNDFISH FILLETS CONTINUED HEAVY IN NOVEMBER 1954: Imports of cod, haddock, hake, pollock, cusk, and ocean perch fillets during November 1954 totaled 11.7 million pounds, compared with 7.3 million pounds in November 1953. A total of 6.9 million pounds came from Canada; 3.8 million pounds from Iceland; and the balance from Norway, West Germany, Greenland, Miquelon and St. Pierre Islands, the Netherlands, Denmark, and Scotland.

During the first 11 months of 1954, groundfish fillet imports totaled 129.4 million pounds--51 percent more than in the same period of 1953. The previous record year was 1952 when 108 million pounds were brought into the country. Considerable quantities of the imports in 1954 are known to be in the form of blocks and slabs which can only be used in the manufacture of fish sticks or portions and, therefore, are not available for sale as fillets.

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SELECTED FISHERY PRODUCTS, OCTOBER 1954: Imports: Fresh and frozen tuna imported during October 1954 totaled 7.7 million pounds, almost equal to that of the same month in 1953. Total imports for the first 10 months of 1954 amounted to 111 million pounds. This represents an increase of 22 percent over the same period of 1953.

Canned tuna imports (2.5 million pounds) in October 1954 were about the same as in October 1953. Imports for the first 10 months of 1954 reached 27 million pounds, about 9 percent less than in that period of 1953. Canned bonito imports during the first 10 months showed a gain of about 30 percent--total during the period, 13.9 million pounds.

Canned salmon imports during October 1954 were down as compared with a year earlier; however, the total for the year through October was still 9 percent above the similar period a year earlier.

Canned sardines in oil were imported in October 1954 in about the same quantity as in October 1953. The total for the first 10 months of 1954 was 10 percent less that in the comparable period of 1953. Canned sardines not in oil showed a substantial drop during October 1954, and the total for January-October was about 37 percent below that of 1953. Imports of sardines in the first 10 months of 1954 totaled 29.3 million pounds as compared with 38 million pounds in the same period a year earlier.

Fresh and frozen salmon imports of 9.4 million pounds during October 1954 were substantially greater than the 5.4 million pounds imported in the same month of 1953. Imports for the first 10 months of 1954 amounted to 24.4 million pounds, an increase of 16 percent over a year earlier.

Shrimp (mostly frozen but including canned, fresh, and dried) imports in October 1954 showed little change from a year earlier. Imports for the year through October reached 32.6 million pounds, a gain of 7 percent over the same period in 1953.

Fresh and frozen lobster imports of 33.6 million pounds during the first 10 months of 1954 were about 4 percent below a year earlier. Canned lobster imports of almost 3 million pounds for the same period were 6 percent below those of 1953.

Canned crab meat imported during October 1954 amounted to only 174,000 pounds, compared with 827,000 pounds in the same month of 1953. The total for the first 10 months of 1954 (2.4 million pounds) was 31 percent below that for the 1953 period.

Groundfish fillets (including blocks and slabs) imported during October 1954 totaled almost 15 million pounds as compared with 10 million pounds for the same month in 1953. Imports for the first 10 months of 1954 amounted to 118 million pounds, an increase of 54 percent over the similar period of the previous year. Other fillets were imported in about the same total quantity for both comparative periods.

Fish meal imported during October 1954 totaled 5,038 tons or about half of the quantity received in October 1953. The total for 1954 through October (128,888 tons) was 16 percent above the comparable period of 1953.

Exports: October 1954 canned salmon exports of 2.4 million pounds brought the total for the first ten months of 1954 to over 6 million pounds. In the first 10 months of 1953 only 2 million pounds were exported.

Exports of canned sardines in October 1954 were slightly above a year earlier, and for the first 10 months of 1954 totaled 9 million pounds. This compares with 8.4 million pounds for the same period of 1953.

Canned mackerel exports in the first 10 months of 1954 declined 79 percent.

Fish oils exported during October 1954 were less than half those of October a year ago, however, the total for the first 10 months of 1954 reached 127 million pounds, 52 percent greater than for the similar 1953 period.

Note: See "Chart 7 - U.S. Fishery Products Imports," p. 86 of this issue.

Washington

COMMERCIAL FISHERIES PRODUCTION, 1954: Commercial fisheries in the State of Washington in 1954 have returned an estimated wholesale market value of $34.3 million, the Washington Department of Fisheries pointed out in a December 13, 1954, release. This compares with $36.5 million for 1953.

The 1954 figures are preliminary estimates only since some fishing was still under way and stocks of canned fish were still on hand, subject to price adjustments at the time of sale. Totals for the estimates are based upon average seasonal market prices.

The total estimated value to the fishermen of the salmon, bottomfish, halibut, and oysters amounted to $21.2 million as against $18.4 million in 1953.

Unit value of fisheries products at the ex-vessel level was higher in 1954 than the previous year. In 1953 the Washington fishing industry harvest of 126.4 million pounds was valued at $18.4 million ex-vessel, while in 1954 a lighter total catch of 118,502,800 pounds brought $21.2 million ex-vessel.

A breakdown of the various food fish catches shows the fabulous sockeye salmon run the top producer of 1954, with 33 million pounds valued at $9.9 million ex-vessel, and a wholesale value tentatively listed as $17.4 million. Chinook salmon ran second with 8.1 million pounds, worth $2.0 million to the fishermen and $3.1 million at wholesale.

The entire salmon harvest amounted to 54.5 million pounds, valued at $14.1 million ex-vessel and $23.6 million wholesale.

Bottomfish, including black cod, flounder, lingcod, perch, rockfish, sole, and true cod, accounted for 37.6 million pounds for an ex-vessel value of $2.2 million and a wholesale value of $3.3 million. Halibut totaled 17.3 million pounds, with an ex-vessel value of $3.3 million and wholesale value of $5.0 million. Oysters produced totaled 9.2 million pounds, with an ex-vessel value of $1.6 million and a wholesale value of $2.4 million.

Wholesale Prices, December 1954

Unseasonal liberal landings of finfish, particularly scrod haddock in the New England area, were responsible for the unusual drop in wholesale prices of most fishery products from November to December 1954. The over-all edible fish and shellfish (fresh, frozen, and canned) wholesale index for December 1954 was 100.5 percent of the 1947-49 average (see table)--2.2 percent lower than in November 1954 and 8.1 percent below December 1953, the Bureau of Labor Statistics of the Department of Labor reports.

The scrod haddock catch in New England in December 1954 was unseasonally liberal and demand was light. The ex-vessel price for large offshore haddock at Boston during that month was 15.2 percent less than in November 1954 and 34.3 percent below December 1953. Heavy inventories accounted for lower western halibut prices at New York City in December 1954--6.1 percent below the previous month and a year earlier. Salmon prices at New York City during the month were up slightly from the previous month. The trend for fresh-water fish prices from November to December 1954 was mixed. The December 1954 index for the drawn,

dressed, or whole finfish subgroup was 7.1 percent lower than in November and 13.8 percent less than in December 1953.

Because shrimp production was light and demand good, fresh shrimp prices rose 8.8 percent in December 1954, offsetting lower haddock fillet prices (down 13.0 percent). Shucked oyster prices remained unchanged. The index for fresh processed fish and shellfish increased 1.8 percent from November to December 1954, but was 16.9 percent lower than a year earlier.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, December 1954 and Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices1/ ($)		Indexes (1947-49=100)			
			Dec. 1954	Nov. 1954	Dec. 1954	Nov. 1954	Oct. 1954	Dec. 1953
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					100.5	102.8	101.8	109.4
Fresh & Frozen Fishery Products:					102.9	106.8	104.9	119.4
Drawn, Dressed, or Whole Finfish:					107.4	115.6	113.6	120.8
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.10	.11	97.3	114.8	94.7	148.2
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.28	.30	87.7	93.4	98.0	93.4
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.58	.57	129.2	127.5	140.5	111.2
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.44	.63	109.1	154.9	130.1	90.5
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.57	.57	114.2	115.2	126.4	126.4
Lake trout, domestic, No. 1, drawn, fresh	Chicago	lb.	.63	.63	129.1	128.1	117.8	125.0
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.39	.35	90.3	82.1	117.2	93.8
Processed, Fresh (Fish & Shellfish):					101.3	99.5	96.6	121.9
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.27	.31	91.9	105.5	71.4	136.1
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.53	.49	84.2	77.4	79.0	114.4
Oysters, shucked, standards	Norfolk	gal.	5.00	5.00	123.7	123.7	123.7	126.8
Processed, Frozen (Fish & Shellfish):					89.2	88.9	89.7	108.7
Fillets: Flounder (yellowtail), skinless, 1-lb. pkg.	Boston	lb.	.38	.38	98.2	98.2	98.2	108.7
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.29	.29	90.2	91.0	84.7	100.4
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.27	111.8	109.8	111.8	110.7
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.47	.47	72.5	72.5	76.4	111.1
Canned Fishery Products:					96.8	96.8	97.3	94.5
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	case	19.70	19.70	104.4	104.4	104.4	93.9
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	case	12.90	12.90	93.0	93.0	93.0	95.5
Sardines, Maine, keyless oil, No. 1/4 drawn (3-1/4 oz.), 100 cans/cs.	New York	case	6.70	6.70	71.3	71.3	74.0	87.3

1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

Frozen ocean perch fillet prices in December 1954 were up slightly, offsetting a small drop in haddock fillet prices. Frozen shrimp and flounder fillet prices in December 1954 were the same as in November. The frozen processed fish and shellfish subgroup index rose 0.3 percent from November to December 1954, but was 17.9 percent below December 1953. All items in the subgroup in December 1954 were priced substantially lower than a year earlier, except ocean perch fillet prices which were slightly higher.

There was no change in the prices of the canned fish items included in the index from November to December 1954 and the canned fishery products subgroup index remained at 96.8 percent. When compared with a year earlier, the December 1954 index for this subgroup was up 2.4 percent due to higher canned salmon prices; but canned tuna and Maine sardine prices were down.

International

UNITED STATES-CANADIAN INFORMAL MEETING ON TRADE RELATIONS

An informal meeting was held in Washington, D. C., January 6, 1955, and a number of problems were reviewed which are of current interest in trade relations between Canada and the United States. Particular attention was devoted to the progress being made at the review session of the General Agreement on Tariffs and Trade, which is under way in Geneva, Switzerland. Among the problems being dealt with at the review session, which are of direct concern both to Canada and the United States, are the future of tariff concessions made under the Agreement, agricultural import restrictions, and the wide-spread use of import restrictions for balance-of-payments reasons.

The meeting was attended by the Rt. Hon. C. D. Howe, Minister of Trade and Commerce, the Hon. L. B. Pearson, Secretary of State for External Affairs, and the Hon. W. E. Harris, Minister of Finance, representing the Canadian Government, and by Hon. John Foster Dulles, Secretary of State, Hon. George Humphrey, Secretary of the Treasury, and the Hon. True D. Morse, Under Secretary of Agriculture, representing the United States Government.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT REGULATIONS FOR 1955: No changes in the North Pacific halibut fishery regulations that might materially increase the removals from the stock in 1955 is the recommendation of the International Pacific Halibut Commission after its recent annual meeting in Seattle presided over by the Chairman, Edward Allen of Seattle.

The Commission reached this decision after a review of the scientific evidence submitted by its staff and after consultation with the industry. It felt that in view of the multiple fishing seasons last year with the resultant great increase in total yield, it is essential that there be at least one more year of observation of the halibut fishery under virtually the same conditions, states a January 27 release from the Commission.

The fishing regulations for the 1955 season adopted by the Commission for recommendation to Canada and the United States are:

1. The fishing areas shall be the same as in 1954, except that the dividing line between Areas 3A and 3B shall be moved from the Sanak Islands to the Shumagin Islands.

2. The opening date for the first halibut fishing season in all regulatory areas shall be May 12.

3. There shall be no changes in the catch limits for the first season in Areas 2 and 3A which were 26,500,000 and 28,000,000 pounds, respectively.

4. The opening and closing hours of all fishing seasons shall be 6 a. m.

5. Area 1B will close when the catch limit for Area 2 (26,500,000 pounds) will have been reached. Area 3B will close when the catch limit of Area 3A (28,000,000 pounds) will have been reached.

6. In addition to the above open seasons, based on the attainment of the catch limits for Areas 2 and 3A, further fishing seasons will be allowed as follows: Areas 2 and 1B, to be reopened on July 27, for 7 days with no catch limit; Areas 3A and 3B to be reopened July 27 for 9 days with no catch limit. Area 3B to again be reopened on August 11 for 23 days with no catch limit. Area 1A to open on May 12 and remain open until the final closing date of Area 3B, i. e. September 3, with no catch limit.

The Commission is responsible to Canada and the United States for the regulation of the North Pacific halibut fishery which now produces nearly 75 percent of the world's production of halibut. The catch during the past year of more than 71 million pounds, an all-time record, was taken by 700 regular halibut vessels manned by 3,000 fishermen.

When regulation began 23 years ago, the catch totaled only 44 million pounds, and required a 9 months' fishing season to take the catch. Under the Commission's management there has been progressive improvement of the stocks and the present 71 million-pound catch was taken in 2 months of fishing.

The additional fish catch over previous years resulted from the exercise of the new authority of the Commission to have multiple open seasons in any one year. The 1953 treaty, which provided that authority, requires also that the Commission develop the fishery to levels of maximum sustained yield.

Richard Nelson of Vancouver and Seton H. Thompson of Washington, D. C., were elected Chairman and Vice-Chairman, respectively, for the ensuing year. Other members of the Commission are: for Canada, S. V. Ozere, Ottawa, replacing G. R. Clark who lately was appointed Deputy Minister of Fisheries for Canada; Harold Holland, Prince Rupert. For the United States the other members are Edward W. Allen, Seattle; and J. W. Mendenhall, Ketchikan.

TERRITORIAL WATERS

PERU, CHILE, ECUADOR SIGN 200-MILE ZONE CONVENTIONS: Delegates from Peru, Chile, and Ecuador at a December 2, 1954, meeting in Lima on territorial waters signed six international conventions, according to a December 6 U. S. Embassy dispatch from Lima. The conventions are as follows:

1. "Convention concerning the granting of permission for exploitation of the riches of the South Pacific." Article 1 states that no fishing will permitted within the 200-mile zone, while Article 5 provides that those requesting permission must indicate the port at which Peruvian inspectors will be taken on board.

2. "Convention regarding means of surveillance and control over the maritime zones of the signatory powers."

3. "Supplementary convention regarding the declaration of sovereignty over the 200-mile zone." Article 1 states, in part, that Chile, Ecuador, and Peru will proceed in joint agreement regarding the juridical defense of the principle of maritime sovereignty of "at least 200 marine miles including the soil and subsoil."

4. "Convention concerning the ordinary annual meeting of the Permanent Commission." Article 1 provides that the Commission will fix the number of sperm whales which may be taken during each season. Article 2 states that the Commission will decide the amount of the fees to be paid.

5. "Convention establishing special frontier zones." This provides for establishing special maritime zones 10 miles wide separating the waters of the three signatory countries.

6. "Convention regarding sanctions." This provides, inter alia, that fines of from 1 to 5 times the value of the catch shall be imposed. Another potential sanction is exclusion from territorial waters for not less than 6 months nor more than 3 years.

These conventions to become effective must now be ratified by the Congresses of the respective signatories.

It was understood that the Peruvian Congress was to meet in special session in December.

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PERUVIAN NAVY CAPTURES PANAMANIAN-REGISTERED WHALING FLEET: The Peruvian Navy in mid-November captured the factoryship and four catcher boats of the Panamanian-registered whaling fleet on the grounds that the vessels were catching whales within the 200-mile zone of coastal waters claimed as subject to Peruvian jurisdiction under the 1952 Santiago Tripartite Declaration. The incident brings to a head the general opposition of maritime nations to this declaration, reports a November 29, 1954, U. S. Embassy dispatch from Lima.

PANAMA PROTESTS PERUVIAN ACTION IN DETAINING WHALING FLEET: The Panamanian Minister for Foreign Relations told the National Assembly that Panama would demand payment of damages for whaling ships operated under the Panamanian flag which were captured by Peruvian naval vessels, unless satisfactory arrangements were reached in negotiations with Peru.

The press (La Hora) carried several articles protesting Peru's action. La Hora's publisher spent several days in Peru as legal representative of the vessels' owner (Aristotle Socrates Onassis). Another newspaper in an editorial (El Dia, November 19) implied that the small revenue received from the whaling fleet was hardly worth risking strained relations with Peru which was the "first American State" to recognize Panama's independence. That newspaper (November 22) suggested that Panama's views were similar to those of Peru in the case of a U. S.-owned vessel that was seized by Panama in May 1953 for alleged violation of Panama's fishing regulations. Other newspapers devoted extensive space to the controversy with Peru, including stories on the whaling fleet owner's background and interviews with members of the crews of some vessels of the whaling fleet which succeeded in returning to Panama, a November 24 U. S. Embassy dispatch from Panama points out.

COLOMBIAN PRESS SUPPORTS PERU IN DETENTION OF PANAMANIAN WHALING FLEET: A Colombian authority on international law has also used the Peruvian incident to advertise his views that Colombia should join with its southern neighbors in claiming control over a 200-mile strip of territorial waters. In an article in El Tiempo on November 25, he attempted to establish a legal basis for the decisions of the recent tripartite conference at Santiago. He stated that the modern doctrine of the continental platform was established by the United States through presidential proclamation in September 1945. He admitted that a distinction

exists between the continental platform and territorial waters but claimed that the two concepts complemented one another and were technically parallel. He stated further: "Not all countries have a continental platform. Therefore, the internationalists have conceived a formula to reestablish the principle of juridical equality of States, giving to those countries without a continental platform some compensation. This is precisely the situation of the countries of the South Pacific, including Colombia. For these circumstances the international jurists have formulated the principle that States lacking a continental platform have the right to regulate hunting and fishing carried out in the zones of the high seas adjacent to their territorial waters up to a limit of 200 miles." (Decision of the Hispanic American Institution of International Law, Sao Paulo 1953.)

Going further the Colombian authority on international law compared the Santiago Agreements to a regional agreement reached in accordance with Articles 52-54, Chapter VII of the Charter of the United Nations. As such, this regional accord has precedence in international law over the precedents invoked by those attacking this South American regional accord. . .

He concluded his article by appealing again for Colombian action to adhere to the continental platform doctrine adopted by Chile, Peru, and Ecuador.

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DETAINED WHALING FLEET FINED $3 MILLION BY PERU: The Panamanian-registered whaling fleet detained by the Peruvian Navy was fined the equivalent of US$3 million. Alleged violations included Articles 731, 740, 742, 743, and 764 of the Merchant Marine regulations. The Peruvian press (La Prensa) reports that the owner of the fleet in commenting on the fine said he believed he would pay promptly--not only because vessels captured are worth at least five times the amount of the fine, but principally because without the factoryship he would be unable to continue the proposed whaling expedition to the Antarctic which would enable him to more than recover the amount assessed. A five-day period for payment of the fine was reported to expire on December 4, according to a U. S. Embassy dispatch from Lima dated December 1, 1954.

The press also reported that the Chilean Secretary General of the permanent commission created under the tripartite declaration stated that since Peruvian action against this whaling fleet was taken solely under its local laws and that the regulations adopted at Santiago in October 1954 do not yet have the force of an International Treaty, provision for equal distribution of the fine does not apply.

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PANAMANIAN WHALING FLEET PAYS $3 MILLION FINE TO PERU: The owner of the Panamanian-registered whaling fleet paid the $3 million fine in December 1954, according to press reports from Peru. It was reported that Lloyds of London had put up the cash. The five vessels detained at the Peruvian port of Callao began to take on provisions immediately in preparation for whaling activities in Antarctic waters.

Recent developments in connection with the territorial waters issue were contained in a dispatch from Oslo, Norway, dated January 10. The dispatch, made available by the Office of Special Assistant for Fisheries and Wildlife, Department of State, reports that the Onassis whaling fleet, seized by Peruvian authorities last November, was released on December 13 on payment of a fine of US$3 million. The expedition was insured by Lloyds of London which, in effect, paid the fine. According to the dispatch, "It has been widely reported that the case will be appealed in international law and the Peruvian claim tested."

". . . a spokesman for the British Admiralty had announced that the British fleet would intervene if South American nations attempted to encroach on the operations of the British whaling expeditions in the Antarctic. The announcement came as

a result of a communication reportedly received from the Chilean Foreign Office to the effect that Chile's claim to a 200-mile limit applied as well to its possessions in the Antarctic. Shipping circles in London were reported to be concerned over the possibility that Chile might employ warships to seize whaling ships now operating in the Antarctic Ocean in the same manner as Peru did in November. (At the same time spokesmen for the British Foreign Office were reported to have declared that Great Britain did not intend to violate its agreement with Chile and Argentina not to send more warships than usual to the Antarctic during the whaling season, and that the British Government would reconsider the agreement only if the Chilean fleet threatened the British whaling expeditions.)"

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PANAMA NEGOTIATING FOR WHALING FLEET SEIZED BY PERU: A Panamanian Government official reportedly announced that Panama was still negotiating with Peru on the Peruvian seizure of the whaling fleet operating under the Panamaian flag in waters off the coast of Peru, and that all recourse for bilateral settlement has not been exhausted. The statement was made in reply to a newspaper reporter's question as to whether Panama would make a formal claim before an international organization. An El Pais editorial (December 9) held that Peru's claim to jurisdiction over waters 200 miles from shore is excessive, but that Panama, in view of its own fishing interests, ought to work for an extension of the three-mile limit, reports a December 10 U. S. Embassy dispatch from Panama.

TRADE AGREEMENTS

UNITED STATES-PHILIPPINES REACH AGREEMENT ON RENEGOTIATIONS: The United States Delegation and the Philippine Economic Mission, after less than three months of continuous negotiation, reached agreement on a revision of the 1946 Trade Agreement to be recommended to the Congresses of their two countries. The Agreement was signed in Washington on December 15, 1954. Notwithstanding honest differences of opinion between the Delegations on several of the issues involved, and despite their vigorous presentation by each side, agreement was reached in a relatively short period because of the spirit of friendship and good will which persisted throughout the negotiations.

The agreement reached underscores the desire of both nations to put their trade relationship on a more normal and stable basis. This Agreement:

1. Yields to the Philippines control over its own currency by eliminating Article V thereof;

2. Eliminates most absolute quotas on Philippine articles entering the United States;

3. Eliminates quota allocation limitations on Philippine articles subject to quotas in the United States;

4. Makes the enjoyment of parity rights by citizens of either country in territory of the other reciprocal;

5. Makes imposition of quantitative restrictions on the products of both countries reciprocal;

6. Gives to citizens of either country the right to engage in business activities in the territory of the other on a reciprocal basis;

7. Provides security exceptions in the mutual interest of both countries;

8. Increases tariff preferences for Philippine articles entering the United States;

9. Decreases tariff preferences for United States articles entering the Philippines;

10. Eliminates the prohibition against the imposition of Philippine export taxes;

11. Provides for elimination of the Philippine exchange tax and the dual rate of exchange it creates by substitution of an import levy to be progressively reduced and eliminated.

12. Permits the Philippines to ask the United States Congress for possible increases in the sugar quota when other nations are permitted to do so; and

13. Increases duty-free quotas on Philippine articles which are subject to declining duty-free quotas in the United States.

It is hoped that with these changes the Philippines will sooner succeed in attaining a better balanced economic status as a free nation. It is also hoped that these changes will further strengthen the friendly and mutually beneficial political and economic relations between the two peoples, a December 15 U. S. State Department release points out.

Under the 1946 agreement, import duties were to be applied by both countries beginning July 4, 1954, at the rate of 5 percent of the basic rate each year for 20 years until full rates were reached after January 4, 1974. The new agreement proposes, with certain exceptions for articles under quota provisions, ordinary custom duties to be collected on articles entered or withdrawn from warehouse at the percentages of the respective duties shown in the table.

Years	Philippine Rate on United States Articles	United States Rate on Philippine Articles
	(Percent of Basic Import Duty)	
1956-58	25	5
1959-61	50	10
1962-64	75	20
1965-67	90	40
1968-70	90	60
1971-73	90	80
1974-	100	100

The proposed revision would permit the Philippines to impose a temporary special import tax in lieu of the present tax on the sale of foreign exchange at a rate no higher than the present rate subject, with certain exceptions, to progressive reduction of 10 percent per year beginning in 1957 and complete elimination proposed by 1966.

The agreement also proposes to delete, among other items, buttons of pearl or shell from the application of the absolute quota provisions and to provide for diminishing duty-free quota. It eliminates most absolute quotas on Philippine articles entering the United States and increases duty-free quotas on certain Philippine articles subject to declining duty-free quotas in the United States.

The agreement provides for the mutualization of rights either party accords to the other in the disposition, exploitation, development, and utilization of natural resources. Each party has reserved the right to limit the extent to which aliens may engage in fishing.

In general, the rights provided citizens of the Philippines may be exercised with respect to natural resources in the United States which are subject to Federal

control or regulations, only through a corporation organized under the laws of the United States or one of its States. Citizens of the United States may exercise their rights in the Philippines with respect to natural resources in the Philippines only through the medium of a corporation organized under the laws of the Philippines and at least 60 percent of the capital stock of which is owned or controlled by citizens of the United States. The rights of either party shall not be exercised to derogate from the rights previously acquired by citizens or corporations or associations owned or controlled by citizens of the other party.

The protocol of the Agreement has been amended to provide additional description of the terms "United States article" and "Philippine article."

Copies of the Final Act of Negotiations Relative to Revision of the 1946 Trade Agreement between the United States of America and the Republic of the Philippines may be obtained from the Department of State, Washington 25, D. C.

The Philippine Government has indicated a desire to revise certain of its import duties and such tariff revision has been under consideration for some time by the Philippine Tariff Commission. Information is not available as to what changes, if any, may be made in the basic Philippine tariff as a result of their Tariff Comission study.

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NORWEGIAN-CZECH AGREEMENT EXTENDED THROUGH 1955: Norwegian-Czech trade negotations were held in Oslo recently and resulted in an extension of the current agreement to cover the calendar year 1955. Under the extended agreement Norwegian exports to Czechoslovakia will include fats and oils; fresh, frozen, and salted fish; fish fillets; and canned fish. No fishery products will be included in Czech shipments to Norway, a December 17 U. S. Embassy dispatch from Oslo points out. The agreement provides for an exchange of goods in 1955 to the value of about 114 million kroner (US$15.9 million) as compared with about 106 million kroner (US$14.8 million) in 1954.

UNITED NATIONS

FISHERIES DEVELOPMENTS IN NON-SELF-GOVERNING TERRITORIES: Most people living in tropical countries are not getting enough proteins in their diet. But if they were to eat more fish and its byproducts, this deficiency could be reduced, according to a report, "Fisheries in Non-Self-Governing Territories," prepared by the United Nations Secretariat.

This report was presented to the General Assembly's Committee on Information from Non-Self-Governing Territories, which met at UN Headquarters August 20 to September 14, 1954.

At present, only about 10 percent of man's animal protein supplies come from sea or fresh water. But if the world is to feed more people and with protein-rich food, the report says that countries will have to turn to the vast, almost-untapped sources of food in the waters of the world.

First of all, however, the fishing industry needs to be streamlined and expanded in most countries. This can be done, the report suggests, by improving catching, processing, and marketing techniques; by aiding fishermen financially; and by continuing research and training.

Improved Catching Techniques: Already, a start has been made in a number of non-self-governing territories. Fishing craft are being mechanized so that they can

exploit more distant fishing grounds and return quickly with their catches; new equipment is being tried out to improve catching methods; and fishermen are learning how to operate and maintain their gear, boats, and engines.

In some cases financial aid is helping to increase production, and cooperatives are being established to give fishermen a better return for their labors and greater opportunities to expand their activities.

In territories where prospects for sea fishing are poor, or in inland areas far from the sea, fish farming may be a profitable source of food. The report suggests, for instance, that fish-rearing may be combined with the cultivation of wet rice; in this way the same area of land covered by water is used to produce both a vegetable and a fish crop. Or, a small holder's farm may combine the rearing of pigs, fish, and poultry with the cultivation of vegetables, rice, and fruit, so as to make maximum use of valuable resources often squandered as "wastes."

Power Boats Aid Fishermen: In the United Kingdom territories the emphasis is on "the development of fish farming in inland waters and the trial and introduction of power fishing methods." For example, in the Windward Islands in the British West Indies larger and more seaworthy power boats are being provided to increase the catch per man-hour and to lower prices of fish. New markets for fish have been found in the islands with the development of roads and motor transport, and of ice supplies and cold storage. The United Kingdom has also begun fisheries research on a regional basis (in East Africa and West Africa, for instance) so as to deal with the broad problems affecting those areas.

In French West Africa port and shore installations are being built to supply the large-scale fishing fleets and to store and distribute their catches; research organizations are receiving equipment and small-scale and commercial fisheries are being developed. The report cites projects at Dakar and Abidjan where fish supplies have become more constant and species of high quality, until recently rare, are now offered regularly on the market.

Fishermen themselves are also receiving help to increase their fish harvest. In Papua, for instance, the Government assists fishermen by the purchase and distribution of nets and other gear. In Jamaica a basic program is the formation of fishermen's cooperatives to increase production, reduce production costs, and to improve marketing and general welfare among fishermen.

Research Projects Produce Results: The report stresses the basic importance of research before a development program can be launched. French West Africa, for instance, has benefited from research and now produces vitamin-rich fish-liver oil. The West African Fisheries Research Institute has explored new fishing grounds for fish exploitation. In Hong Kong the Fisheries Division has opened a center to train fishermen in the efficient management of mechanized vessels.

Inland fish farming has also made good progress in a number of non-self-governing territories. In the Belgian Congo fish ponds have increased from 15,000 in 1950 to 47,000 in 1952. In French West Africa commercial fish culture is benefiting large centers of population by making up for the shortage of meat. In Morocco a new species of fish is now bred. In Malaya a kind of African fish was introduced for inland fishing.

French West Africa is named as a territory where there are extensive facilities for marketing, distributing, and processing fish. Fish flour and fish oil are being produced in Senegal.

Joint Marketing Enterprise: In the British territory of Uganda the Fish Marketing Corporation represents an enterprise jointly run by the government and the

African fishing companies. It helps in the marketing of fish by transporting it to the larger towns and populated areas after processing or on ice, thus providing the fishermen with a far larger market for their catches. In Hong Kong the Government Wholesale Fish Marketing Organization also gives aid on a large scale.

Since most neighboring countries have similar problems, various governments in different regions have formed councils to coordinate individual efforts, the UN report notes. For instance, the Indo-Pacific Fisheries Council was set up as a coordinating agency to integrate the administration, research, and development of fishing gear and methods for its preservation, and the planning and organization of training centers for farming and fisheries statistics.

Caribbean Conference: The Caribbean Research Council and the Caribbean Commission jointly convened a conference of Caribbean governments in 1952. Besides making technical suggestions, the conference recommended that a fisheries research program be adopted in the Caribbean region. It also urged the governments to exchange information and hold periodic meetings.

Such international and regional organizations are "a most valuable factor" in the development of fisheries.

"In many territories, increased production indicates progress in the development of fisheries," the study concludes. "Very large increases, however, forming major contributions towards filling the animal protein shortage in most cases cannot be expected before a substantial part of the groundwork has been completed."

WHALING

ANTARCTIC WHALING SEASON OPENED JANUARY 7, 1955: The 1955 Antarctic pelagic baleen whaling season got under way on January 7, 1955, the starting date for the taking of fin and sei whales. This is 5 days later than the opening date of the previous season, according to the December 13, 1954, Foreign Crops and Markets, a U. S. Department of Agriculture publication.

The change in the starting date is one of several amendments that were made to the Schedule of the 1946 Convention for the Regulation of Whaling during the meeting in Tokyo in July 1954 of the International Whaling Commission. Those amendments, which became effective on November 8, 1954, provide for:

1. The starting date for factoryship operations for the 1955 Antarctic season to be January 7 for the taking of fin (and sei) whales, and January 21 for the taking of blue whales.

2. A reduction from 60 to 57 feet in the minimum size of fin whales which may be taken.

3. The complete protection of humpback whales in the North Atlantic Ocean and in the waters south of 40° F. latitude, between 0° longitude and 70° W. longitude, for a period of 5 years.

4. Variable open seasons for land stations used for taking or treating minke whales.

In the preceding Antarctic whaling season, 17 expeditions produced around 367,000 short tons of whale oil and about 25,000 tons of sperm oil. In the coming season there will be 19 expeditions with some 232 catching boats employed. However, this number may be reduced to 18 as the factoryship Olympic Challenger, which operates under the Panamanian flag, was seized by the Peruvian Navy in mid-November for the alleged violation of territorial waters of Peru.

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BULK OF 1954/55 ANTARCTIC WHALE OIL SOLD: The Norwegian Whaling Association announced on December 14 that the Norwegian whaling companies' marketing pool had succeeded in selling forward their entire anticipated production of whale oil from the 1954/55 Antarctic whaling season, reports the January 10, 1955, Foreign Crops and Market, a Department of Agriculture publication.

Production in the 1954/55 season has been forecast by the Association at about 165,000 short tons, valued at US$32,200,000. By November 23, 1954, a total of 97,000 tons of whale oil, valued at about US$18,480,000, had been sold forward to one United Kingdom and to two Norwegian consumers; the sale price to the British concern was reported to have been £75 per metric ton (US$190 per short ton) and to the other two purchasers 1,500 kroner (US$190) per ton. This was the minimum price at which sales could be made according to the agreement among members of the pool. By November 29, 1954, an additional 23,000 tons of oil valued at about US$4,600,000 had been sold to buyers in Denmark, Iceland, Germany, and the United Kingdom at prices ranging from US$194 to US$197 per ton. The latest report states that the remaining 45,000 tons were sold to undisclosed buyers at a price of US$203 per ton.

The world market price of whale oil was authoritatively reported recently to have ranged between US$187-190 during September and October 1954. From that point the price has risen steadily during the period of forward selling. As the chairman of the Norwegian Whaling Association has pointed out, early forward sales normally take the form of large quantity sales to important purchasers at minimum prices; later sales in smaller quantities command higher prices.

The Oslo press reported on December 14, 1954, that most of the non-Norwegian whaling companies had also reported substantial forward sales of whale oil from the 1954/55 whaling season. The British company which operates the Balaena expedition was reported to have sold its entire production at around US$190 per ton, while the other company from the United Kingdom, which operates the Southern Harvester and the Southern Venturer, was said to have sold out at prices ranging between US$190 and US$203 per ton.

The South African company owning the Abraham Larsen expedition was also reported to have sold its entire anticipated production at prices similar to those obtained by the second British company. The press reported that only the Panamanian expedition and the Argentine land station, of the companies which normally sell their whale oil on the world market, had not yet reported forward sales. Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette) for November 1954 reported that the Japanese expeditions had sold forward 29,760 tons of their anticipated production: 19,840 tons to Germany at US$187 per ton, 3,310 tons also to Germany at US$188, and 6,610 tons to Sweden at about US$190 per ton.

Aden

LOANS TO FISHERMEN FOR MECHANIZING CRAFT: The Government of Aden announced on November 25, 1954, the extension of loans to fishermen for the mechanization of their craft. This scheme, if actively pursued, should in time help provide Aden with fresh fish on a more regular basis, and will mean a great incentive to the local fishermen to improve their methods.

Two fishermen's cooperatives have been recently formed in Aden with the help and encouragement of the local Labor Office. These measures are perhaps the first serious efforts on the part of government to help develop the fishing industry of Aden along modern lines. The waters around the Colony are abundant with fish of

many varieties. The fishing techniques, gear, and type of sailing vessel have not changed for centuries.

If properly encouraged, Aden could easily develop a substantial industry which, with the introduction of refrigeration, could very well help supply many of the neighboring countries with large quantities of fresh fish. This in turn would be a boon to the local fishing community and to the economy of Aden as a whole, which more and more must rely on the development of its own resources to prosper and maintain an increasing pace of production.

The zambuk, or dhow, is the traditional sailing craft of Arabia and its seaworthiness has been proven through the ages. Its design and construction have not varied appreciably in many centuries. The construction of dhows is an important activity of the native Adenis, and an increase in the fishing activities of the Colony would of course result in a greater prosperity for the local ship builders.

The text of the Aden Government press communique is as follows:

"Under a development loans' scheme, fishing zambuks will be mechanized under the supervision of the Fisheries Department.

"During the past month three marine Diesel engines of 7/9 hp. have been installed in three fishing zambuks of Arab fishermen from Bereika and Fokum, thus bringing the total number of mechanized fishing zambuks in the Colony to five. The total cost of installation, including the cost of the engine, is about £300 (US$840).

"The engines are issued to fishermen on hire-purchase basis. Repayment is by easy instalments covering a period of four years.

"The mechanized zambuks develop a speed of $5\frac{1}{2}$ knots. This is viewed by the fishermen very favorably, as it gives them advantages over unmechanized zambuks which are mainly dependent on the vagaries of the wind in carrying their catches to the market in good condition."

Australia

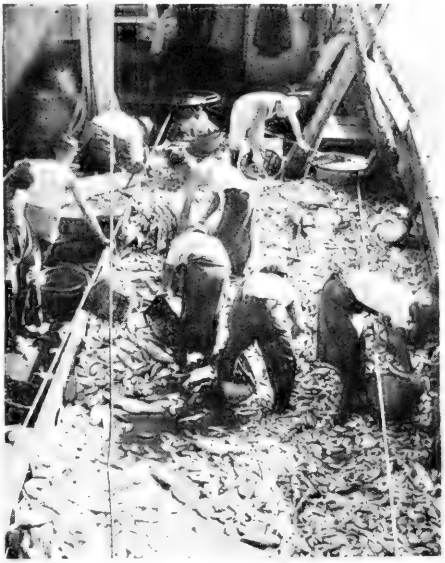
JAPANESE REPORTED FISHING 50 MILES OFF AUSTRALIAN COAST: There was considerable confusion and anti-Japanese outcry in the Australian press following recent reports of Japanese fishing boats seen some 50 miles off the Australian coast and the discovery of fishing buoys with Japanese markings washed up on the coast. Australian newspapers claimed Australia now has the "right" to control fishing in Australian waters outside the territorial limits under the Fisheries Act of 1952, including swimming fish in the same manner they now claim control of products of the sea bed under the Pearl Fisheries Act.

The Australian Minister for Commerce and Agriculture issued a statement January 6, 1955, saying his government had never sought to exercise control of the swimming fisheries other than fishing by Australian nationals. "As legislation stands, he said, "there was nothing to stop Japanese vessels from taking swimming fish from waters outside the territorial limits." At the same time the Navy and Air Force would keep the Government informed of operations of Australian and foreign vessels. He reiterated the Australian Government's complete determination to exercise the right to control sedentary fishing on the continental shelf.

Burma

FISH SUPPLY, 1954: The supply of domestic fish available on the local Burmese market apparently increased slightly during 1954. A firm which chartered a Japanese vessel in late 1953 to initiate deep-sea fishing was reasonably successful.

Hauling the catch aboard the Japanese trawler Taiyo Maru operating out of Burma.



Sorting catch on the Japanese trawler Taiyo Maru operating out of Burma.

The vessel made 5 fishing trips each 2 months with catches of about 70,000 pounds each trip. Indications are that fresh-water and inshore fishing continued at about the same level and thus domestic fish supply appears to have increased by about two million pounds yearly. The apparent success of this venture indicates that in the near future Burma is more likely to be self-sufficient in fish than in many other food items, according to a U. S. Embassy dispatch (November 2, 1954) from Rangoon.

Canada

NEW SHRIMP FISHING AREAS IN BRITISH COLUMBIA: The discovery of two promising shrimp fishing areas in British Columbia was reported late in 1954 by the scientist in charge of shrimp and prawn research at the Pacific Biological Station of the Fisheries Research Board of Canada at Nanaimo, B. C.

The scientist, whose investigations were responsible for two important shrimp finds in the Gulf of Georgia and Chatham Sound in 1953, said that the shrimp trawler Yuri M, under charter to the Research Board in cooperation with the industrial development program of the Canadian Department of Fisheries, had recently found shrimp in commercial quantities in two areas of Georgia Strait. A small area off

Gabriola Island, near Nanaimo, and another off the south end of Galiano Island, near Salamanca Point, each yielded an average of three pounds per trap in test fishing late in August 1954.

For shrimp fishing the vessel was equipped with strings of traps in series of eight, set on the principle of ground-line fishing. Traps were of a collapsible type developed by the biographical station from a design by a Nanaimo fisherman. Shrimp occurred in waters where the bottom was rocky and unsuitable for trawling.

The scientist also reported a new potential shrimp fishing area in Imperial Eagle Channel, Barkley Sound, where the Yuri M in test trawls found enough shrimp to indicate a moderate fishery, reports the October 1954 Trade News, a Canadian Department of Fisheries magazine.

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BRITISH COLUMBIA CANNED SALMON PACK, 1954: The 1954 British Columbia salmon canning season ended early in December with a total pack of 1,743,406 cases (48 1-lb. cans), the Canadian Department of Fisheries reported on December 8 (see table). This was a decrease of 4.3 percent from the 1953 pack of 1,821,269 cases, due to a large drop in the production of pink salmon as 1954 was an off-year for this species. The pack of all other varieties of salmon was greater than a year earlier. The 1954 pack was 10.8 percent below the 1951 pack (1,955,475), the highest in recent years, but well above the production in 1948-1950-1952, other recent off years for pink salmon.

British Columbia Canned Salmon Pack, 1949-54

Species	1954	1953	1952	1951	1950	1949
	(Std. Cases 1/)					
Sockeye (red)	680,930	510,100	449,174	428,217	408,041	259,880
Blueback. . .	4,302	2,055	5,581	13,224	7,371	6,876
Spring (king)	14,066	12,177	9,064	13,631	9,133	21,065
Coho (silver)	124,084	108,115	58,514	300,521	109,272	208,063
Pink.	335,777	793,382	675,836	735,494	446,516	709,217
Chum (keta) .	580,515	392,716	91,514	460,740	498,984	226,241
Steelhead . .	3,732	2,724	3,752	3,648	3,243	2,381
Totals . . .	1,743,406	1,821,269	1,293,435	1,955,475	1,482,560	1,433,723

1/ A standard case consists of 48 1-lb. cans.

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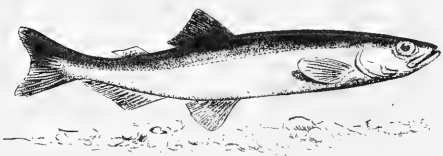
NEWFOUNDLAND CAPELIN FISHERY: Capelin are extremely plentiful in the Newfoundland area but are only readily available during the spawning season in June and July.

These little fish are used extensively as bait for cod, fertilizer for potatoes, food for dogs and mink, for preparation of pet food; and for human food in the fresh, frozen, salted and dried, or smoked condition. In recent years one herring meal plant has often manufactured fish meal and extracted oil from capelin, and so extended its operations for several weeks after the herring disappeared from the inshore areas, according to the November 1954 Trade News, a Canadian Department of Fisheries publication.



Capelin (Mallotus villosus)

Female capelin are, on the average, smaller than males. The moisture content does not vary much between the sexes but the males are fatter. The males are sturdier than the females with a larger bone structure. The spawning capelin usually have some sand grains in their stomachs. The percentage of fat would doubtless be slightly higher (and the moisture lower) before spawning begins and lower (with moisture higher) at the end of the spawning season.

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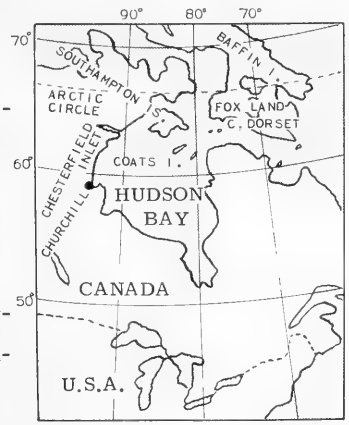
EASTERN ARCTIC BIOLOGICAL INVESTIGATIONS: General biological investigations of northern Hudson Bay were continued in 1954 by scientists of the Fisheries Research Board of Canada aboard the Calanus, the Board's Arctic research vessel. The investigations were extended to include a study of the walrus of Coats Island and a study of the biology of the seals of the Cape Dorset area of southwestern Baffin Island, according to the October Trade News of the Canadian Department of Fisheries.



The field program began earlier than usual, with one of the research assistants being flown to Cape Dorset in February so that the seal investigation could include work on the animals at whelping and breeding times, during March and April. He traveled extensively about Foxe Peninsula by dog sled and later in the season by boat, collecting material on the biology of the northern species, in particular the ringed and square flipper seals. He also took samples, through the ice, of the water some miles off Churchill, as it was thought important to get information on the winter conditions of the waters of Hudson Bay, where hydrographic work previously had been limited to the summer season.

The Calanus sailed from Churchill in mid-July, and visited Chesterfield Inlet, Coral Harbour on Southampton Island, and Coats Island. During the summer plankton, benthos, and littoral collections were made and water samples taken for analysis.

The walrus investigation was carried out by a research assistant who was put ashore in late July with two Eskimo helpers. During their three weeks on the island, they took walrus specimens and gathered data on body measurements, feeding habits, age, and factors concerning reproduction. A new method of tagging was instituted and, if this year's experiments are satisfactory, will be extended in the future in order to determine the movements of the walrus populations. Twenty-three animals were marked with especially designed stainless steel darts which were placed in the upper part of the walrus' backs.

The Calanus, which has been based in Ungava Bay and Churchill for the past six years, sailed to Montreal at the end of this year's investigations to be dry-docked for overhaul and for refitting with new equipment for future work in northern waters.

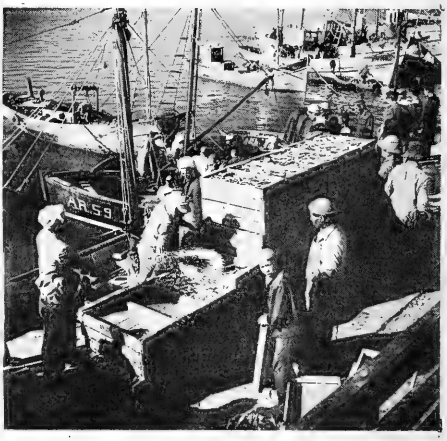
Ecuador

SHRIMP EXPORT TAX: Ecuadoran frozen shrimp exports by firms having fishing contracts or concessions with the Government are subject to a tax, according to a decree promulgated in the Registro Oficial of August 5, 1954. The tax amounts to 40 centavos per kilo (1.2 U.S. cents per pound) for raw frozen shrimp with 15 centavos per kilo ($\frac{1}{2}$ U.S. cent per pound) additional for shrimp fully prepared for serving, reports a December 21 U. S. Embassy dispatch from Quito.

French Morocco

FISHERIES TRENDS, JANUARY-OCTOBER 1954: Production: The total catch of fish in French Morocco January-October 1954 amounted to 30,000 metric tons less than in the same period of 1953. Only 25,000 tons of sardines were landed at Agadir as compared to 40,000 tons in 1953; at Safi, 26,000 tons in 1954 against 33,000 tons in 1953. Specialists claim that fish was of better quality in 1954, but supplies were insufficient to meet factory requirements, and there was little hope that the situation would improve by the end of the year, an October 28 U. S. consular report from Rabat states. The same situation prevailed also with tuna--at Agadir in 1954 supplies amounted to only 500 metric tons against 2,000 the previous year. As for madrague (tunny-net) fishing, which is practised both in the north (Port-Lyautey) and the south (Agadir), the catch was 400 tons in 1954 as compared to 1,000 tons in 1953. On the other hand, the 1954 trawler catch (for fresh consumption) of 5,300 tons was practically equal to the previous year's 5,700 tons.

Sardines pursed in fish net off the coast of French Morocco (near Safi).



Unloading sardines at the fish pier in Agadir.

As livestock numbers cannot be increased in the proportion requested, technicians have thought of using sea products to improve the Moroccan population's diet, especially as Morocco's and Mauritania's coasts provide plenty of edible fish of

French Morocco's Fresh Fish Consumption and Exports, 1948-1954

	1954 1/	1953	1952	1951	1950	1949	1948
	(in Metric Tons)						
Fishing centers	14,000	15,060	18,766	10,309	10,304	13,411	8,854
Within Morocco	1,000	4,596	5,433	3,488	3,110	3,323	3,875
Total Morrocco consumption	15,000	19,656	24,199	13,797	13,414	16,734	12,729
Exports	3,000	3,924	757	1,335	785	570	662
Total Supply of Fresh Fish	18,000	23,580	24,956	15,132	14,199	17,304	13,391

1/ Estimated.

all kinds. Actually, however, most Moroccans, particularly in the country, show a certain dislike for fish. Moreover, serious problems of transportation and refrigeration have to be solved, and the present prices of fish are prohibitive for most native consumers, except in coastal fishing centers. As a consequence, a large part of the fish supplies, which should be sold for fresh consumption (and cannot be used by canning factories) are delivered at very low prices to fish-meal and fish-oil industries.

In 1953, out of a total catch of 128,000 metric tons, 104,178 tons were sold to canning and byproducts factories, and only 23,700 tons were consumed fresh (15,055 tons in fishing centers, 4,600 in the interior of Morocco, and 4,000 tons exported to Algeria, France, and Italy). So, consumption of fresh fish per capita and per annum has been only 2.5 kilos (5.5 pounds), although it reaches 8 kilos (17.6 pounds) in Casablanca and 21 kilos (46.2 pounds) at Safi. Actually, apart from the coastal regions, fish consumption is practically unknown in Morocco.

Fishing Fleet: As of December 1953, the fishing fleet of French Morocco amounted to about 1,800 boats of all kinds, employing 8,700 men (7,500 of which were Moroccans). The fleet consisted of 56 trawlers, 281 sardine seiners, 68 sardine trawlers, 130 motorized spiny lobster and line-fishing boats, and 1,221 hand- and sail-powered spiny lobster and line-fishing boats. However, these figures probably changed during 1954 as many boats moved towards southern Morocco in search of fish. The catch in 1954 was disappointing. Sardine and tuna for canning, as well as other fish for fresh supply, were scarce on Morocco's coasts. Some experts stated that this shortage was due to previous intensive fishing; others say that fish have moved to other colder waters. The Institute of Scientific Fishing recommended, therefore, the use of detector boats.

German Federal Republic

NEW PLASTIC FISH CONTAINER: A new plastic container ("Kiel Table Container") for fishery products has been patented in West Germany, according to International Fish and Other Food Journal (vol. II, no. 3, 1954), a Danish publication. The new container is made from Polyvinylchlorid (PVC) and is the product of a year-long development which began with the packing of fish and food specialities in pliofilm and Polyathylen bags. It was perfected with the PVC container in a patented carton for protection against mechanical damage and for stiffening of the form of the container.

These are the fundamental differences between the PVC container in square-formed half cartons and the tin-plate can: PVC container can be opened readily and easily with the attached scratcher, the other end of which may be used as a fork to eat the contents of the container. The light weight of the plastic container reduces the freight charges; the lower price of the plastic container should result in a larger turnover; the customer can see the goods. Further advantages are the noncorrosion factor of the PVC container and the avoidance of chemical "swells."

For the present the new container will be hermetically sealed by an electrically-heated apparatus, which means an air- and water-tight seal, only usable for half-preserves, i. e. cold, fried, or cooked marinated fish, smoked sliced saithe in edible

oil, salted anchovies, herring fillets in oil or brine, gaffelbiddar, roe or caviar, marinated mussels, salads with herring, salmon, shrimp, lobster, vegetables, meat, etc. The development of the new container has only begun. In view of the versatility of the plastic materials and the speed of the development of the techniques, many possibilities exist.

The German Government has shown great interest in this new table container and and recently the German Minister of Food and Commerce together with the Director for Fisheries in the Agriculture Department have visited the manufacturer of the container.

Jamaica (British West Indies)

FROZEN SPINY LOBSTER TAIL EXPORT TRADE TO BE DEVELOPED: The development of an export trade in frozen spiny lobster tails is the initial step in the development of the fisheries of Jamaica, a November 10, 1954, U. S. consular dispatch from Kingston points out. The Jamaican Industrial Development Corporation is actively investigating fisheries development, particularly in the banks lying from 30-150 miles offshore--that area which is not now reached by the 5,000 local fishermen using mostly small pirogues.

The promotion officer of the Industrial Development Corporation visited the United States in late 1954 and reported a keen interest and bright prospects for Jamaican spiny lobsters, states a December 31, 1954, U. S. consular dispatch from Kingston. The Corporation will soon commence shipping spiny lobsters by air to Miami, Florida. A refrigerated trailer unit, which will be used to pick up the spiny lobsters from collecting points, had already arrived.

Japan

TUNA STOCKS AND EXPORT PRICES: Canned Tuna in Brine: The stocks of canned tuna in brine on hand in Japan early in November 1954 amounted to about 700,000-800,000 cases, according to correspondence from the U. S. Embassy at Tokyo. The average export price for the No. 2 (7-oz.) can was US$11.01 for white meat and US$8.26 for light meat, per 48-can case, f.o.b.

Frozen Tuna: The stocks of frozen tuna on hand in Japan in early November 1954 were not available, but stocks of albacore tuna were estimated at about 1,500 metric tons at that time. Export prices were: albacore US$300 per ton f.o.b., yellowfin US$255 per ton f.o.b. The check (floor) price for albacore tuna was lowered from US$350 to US$300 per ton on November 8, 1954.

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FISHING INDUSTRY STATUS: Both in the number of fishing vessels and in the total annual catch, the Japanese fishing industry currently is above the prewar level. This surging recovery is remarkable, but it is also absolutely necessary as Japan depends so heavily on marine products as an important food source and export item. Fishing is one of Japan's basic industries. On its development greatly depends the economic prosperity and health of the Japanese nation, states the November 24 bulletin of the Japanese Consulate-General in Los Angeles.

National life in Japan has been closely linked from ancient times with the abundance of types and quantities of the marine life to be found not only in her surrounding

waters but also in the two sea currents--Kuroshio (warm current) runing to the north from the Southern Pacific and Oyashio (cold current) running to the south from the Northern Pacific.

Fishing in Japan was placed on an industrial scale since the beginning of the 20th Century with the development of modern scientific techniques. The last war, however, dealt the industry staggering blows. Japan lost 45 percent of her territorial area, thus cutting down the food-producing area to the four main Japanese islands, which have always been intrinsically poor in dairy products and other protein-containing foodstuff. Now more than ever before, it has become dependent on protein from marine products. But the fishing industry itself suffered the loss of a large number of fishing craft, with the resultant sharp decrease in the total catch. And many Japanese are directly dependent on fishing for their livelihood.

Fishing Fleet: Fishing vessels in Japan in 1953 numbered 440,000 with a total tonnage of 1,210,000 gross tons. This far surpasses the prewar maximum of 360,000 vessels. Of these 440,000 vessels, however, approximately 70 percent (300,000 vessels) are non-motorized, while 85 percent of the remaining powered vessels (110,000 vessels) are small craft of less than five tons.

The Japanese fishing fleet after the war has markedly raised its productive level with the adoption of modern scientific techniques. Large fishing vessels equipped with electronic locators and radars are in operation, and fish nets made of synthetic fibers are in use.

However, many small-scale groups are still operating in the narrow fishing grounds in the coastal areas. Their technical level remains low, and the annual output per group is worth only US$570 or less. Also, economic factors operating in the distribution system are not altogether advantageous to those directly engaged in fishing.

Catch: Japan's prewar catch averaged 3,700,000 tons and topped the world list. This, according to the data of the United Nations Food and Agricultural Organization, corresponded roughly to 20 percent of the total world catch. It dropped to only 1,610,000 tons in 1945, the year of Japan's surrender, but in 1953 it reached 4,250,000 tons, well above the prewar level. This attests to the strenuous national reconstruction efforts in this field during the eight years since the surrender.

Consumption and Exports: The majority of the Japanese fishery products goes into the daily diet of the Japanese people. Some 90 percent of domestic consumption goes for food; the remainder being used for fertilizers and fish oil. The greater use of marine products for food than before the war is one feature of the postwar years. This can be attributed to the improved consumption level among the general population, which keeps in line with the national reconstruction, and more particularly to the increased demand for marine products as food among the farming population.

However, in the case of sardines, salmon, crab meat, and tuna, a considerable portion of these species are exported abroad as frozen or canned goods. In 1953 this export totaled 151,000 tons, valued at US$80,000,000.

Fishery Enterprises: According to the 1954 statistics, the number of fishery enterprises in Japan totals 250,000. Of this number, 93 percent (230,000) are individual proprietorships, 91 percent (210,000) of which are small-scale businesses with not more than five employees each. They operate with nonpowered craft or powered vessels of not more than three tons.

A salient characteristic of these small fishery groups is that only 14 percent of them are full-time fishery groups, and most of the remainder are concurrently engaged in small-scale farming or other part-time labor.

A limited number of private enterprises (individual proprietorships) together with 960 (0.4 percent of the total) corporate bodies are carrying on large-scale coastal, offshore, and high-sea fishing. An estimated 330,000 men are in their employ, 25 percent of whom belong to the households engaged in part-time minor-scale fishery mentioned previously. The number of people engaged in fishery management or in fishing for livelihood and the members of their families totals 2,900,000.

Government Aid: In view of this situation, the Japanese Government is rushing measures to stabilize the management in the fishing industry. In light of the fact that the Japanese people, compared with those of the Western countries, have a diet which is insufficient in protein, fishery production must be stabilized to improve the diet and the health of the nation.

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SARDINE AND HERRING FISHERIES, 1954: Catch and Oil Production, January-June: Prospects for Japanese sardine and herring oil production are very poor as the catch has decreased every year for the past five years, according to recent correspondence from the U. S. Embassy at Tokyo. The total production of sardines for the first six months of 1954 amounted to 278-million pounds, 20 percent less than in the same period in 1953; while the herring catch of 287 million pounds was down 50 percent (see table).

Japanese Sardine and Herring Catch and Oil Production, Jan.-June 1954 with Comparisons

Item	1954	1953	
	Jan.-June	Jan.-June	Jan.-Dec.
	(Lbs)		
Sardine catch	277,789,300	345,851,400	616,686,920
Sardine oil production	1/	1/	3,627,222
Herring catch	286,886,300	585,350,600	746,787,773
Herring oil production	1/	1/	2,958,179

1/ Not available.

This light herring catch was due to the poor migration of Hokkaido spring herring from March to May 1954, which recorded the worst catch since 1944. The decrease in sardine production was due to the poor catch on the fishing grounds around the Goto District (southern Japan), the principal Japanese sardine production area.

Canned Sardine Pack, January-October: Total Japanese production of canned sardines during the 1954 season up to October 30 amounted to 341,399 cases, about one-half the pack for the same period in 1953.

Canned Sardine Export Stocks and Prices, October 1954: The unsold stocks of canned sardines on hand in Japan as of October 30, 1954, totaled 80,102 cases. Export price for the Oval #1(15-oz.) can on the same date was US$7.40 per 48-can case, f.o.b.

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WHALING FLEETS LEAVE FOR ANTARCTIC: Japan for the first time has three whaling fleets in the Antarctic, according to the December 13, 1954, Foreign Crops and Markets, a U. S. Department of Agriculture publication. The factory-ship Tonan Maru sailed for the Antarctic on November 3, 1954, the Nisshin Maru sailed on November 5, and the newly-converted Kinjo Maru was scheduled to depart on November 20.

It is reported that the Japanese Government has filed a formal protest with the International Whaling Commission against the new ruling prohibiting the taking of blue whales in certain areas of the North Pacific Ocean for a period of five years.

However, since the Japanese Government is interested in the preservation of whale resources, it reportedly will control the future catch of northern Pacific whales on an independent and reasonable basis.

Republic of Korea

FIRST UNKRA-FINANCED FISHING VESSEL LAUNCHED: The first Korean fishing vessel built with money loaned by the United Nations Korean Reconstruction Agency (UNKRA) has been launched at Kunsan, UNKRA officials announced November 12. The vessel is one of 14 improved Eastern-type boats for which UNKRA loans have been approved. Money has also been advanced for another 9 which are designed after European power- and sail-type boats.

The vessel is a 13-ton long-line 28-footer, powered with a 25-horsepower engine. The owner was advanced 1,118,000 hwan (about US$4,000) from a 50-million-hwan revolving loan fund established by UNKRA in February 1954. The money enabled him to buy 7,200 board feet of imported lumber from the UNKRA stockpile, and a locally-produced power unit.

The loan fund, part of UNKRA's US$3.5 million program of aid to the vital fisheries industry, is administered by the Special Fisheries Control Committee established by UNKRA and the ROK Government. Money is also available to help small fishermen improve their equipment through the purchase of nets, ropes, and other fishing gear.

Other UNKRA aid to the fishing industry, second in importance only to agriculture in the Korean economy, includes: the rehabilitation of important wholesale fish markets at Inchon and Seoul; the construction of new boats; aid in the rehabilitation of ice-making plants and canneries; the purchase of deep-sea trawlers to help Korean fishermen extend their sphere of operations; and the procurement of fish nets, sail cloth, net and wood preservatives, fish hooks, diving apparatus, and other needed items.

Mexico

MERIDA SHRIMP EXPORTS TO U. S., JULY-SEPTEMBER 1954: Frozen shrimp exported from the Merida District of Mexico through the ports of Cuidad del Carmen and Campeche totaled approximately 1,520 metric tons in the July-September 1954 period. This is an increase of 42 percent as compared with 1,071 tons exported during the second quarter (1954), a November 3 U.S. consular dispatch from Merida points out. In the first quarter of 1954 a total of 1,086 tons were exported. All frozen shrimp sold abroad is shipped to the United States.

The average Carmen-Campeche prices for 15-20 count shrimp for the second and third quarters 1954, and for the corresponding periods for the three previous years were as shown in table.

Months	1954	1953	1952	1951
	(U. S. cents per pound)			
Apr.	38	60	37	33
May	42	70	36	34
June	35	70	38	37
July	41	60	40	40
Aug.	42	55	42	38
Sept.	36	47	42	35

Prices in the third quarter of 1954 were slightly better than in 1951 and about the same as in 1952, but considerably below the abnormal prices reported in 1953.

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GOVERNMENT TO BUILD REFRIGERATION PLANT: A refrigeration plant to hold 150 metric tons of frozen fish will be built by the Mexican Government in Progreso, a November 3 U. S. consular dispatch from Merida states. The plant will be capable of making 10 metric tons of ice daily, and will cost 600,000 pesos (US$48,000). It was expected work on the building would commence before the end of 1954 and the plant would be in operation by mid-1955.

Norway

FISHING FLEET, 1954: The total registered Norwegian fishing vessels as of March 1, 1954, amounted to 35,193 craft, according to information contained in a new edition of Register of Norwegian Fishing Craft issued by the Norwegian Director of Fisheries. Of these, 266 are decked steel vessels, 12,127 decked vessels built of wood, 22,455 open motorboats, and 345 are boats without motor.

Compared with the corresponding figures as of July 1, 1953, this represents an increase of 19 as regards decked vessels built of steel and an increase of 67 with regard to decked wooden vessels. The number of open powered boats has been reduced by 196 while the reduction of open boats without motor amounts to 79. The total reduction in the number of registered fishing craft during this period amounts to 189 vessels.

Of the 12,060 decked wooden vessels registered in 1953, 2,974 were less than 30 feet, 6,889 were from 30-49 feet, 1,723 from 50-69 feet, 307 from 70-89 feet, 153 from 90-119 feet, and 14 of 120 feet or more. Their total gross tonnage amounted to 223,067 tons.

About 80 percent of all open boats in 1953 were less than 25 feet and no boat exceeded 50 feet. They had a total tonnage of 69,115 gross tons while the 247 decked steel vessels had a tonnage of 47,595 tons. The gross tonnage of all open as well as decked fishing craft in 1953 was 339,777 tons.

The county of Nordland has the largest number of fishing boats. More than twice as many fishing boats belong to this county as to More and Romsdal which comes next. This is mostly due to the large fleet of open fishing boats in Nordland but this county has also by far the largest number of decked vessels. The more seagoing vessels, however, belong to More and Romsdal. This is indicated by the fact that More and Romsdal has nearly half of all fishing vessels built of steel.

For each vessel the register gives information on ownership, the vessel's dimensions, building material, year of building, and year of rebuilding. Further, it is stated whether the vessel is equipped with radiotelephone or echo sounder. For all vessels with mechanized propulsion, data on the engine are given as to type, year of manufacture, and horsepower.

Registration is required of all decked fishing vessels and is also compulsory for all open fishing boats using mechanized propulsion. Other open boats of which registration is required are those taking part in a fishery for which special supervision is established. Thus, nearly all fishing boats of any importance are subject to registration. Accessory boats, however, are not included in the register.

While previous editions included vessels intended for the conveyance of fresh fish from the fishing grounds, these vessels are no longer subject to registration and have been omitted.

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SOME 1954/55 ANTARCTIC WHALE OIL SOLD: Norwegian whaling operators had so far sold 88,000 long tons of their 1954/55 Antarctic whale oil production, at a price of Kr. 1,500 (US$210) per long ton, according to a December 2 bulletin from the Norwegian Information Service. This price is said to be the minimum acceptable to the whaling companies; it is somewhat lower than prices quoted recently for small quantities for immediate delivery.

The total Norwegian production of whale oil during the 1954/55 season is expected to be 150,000 long tons; thus 60 percent of the expected production has already been sold. For the 1953/54 catch, an average price of £68 (US$190) per ton was obtained.

Panama

SHRIMP EXPORTS, NOVEMBER 1954: Panamanian shrimp exports during November 1954 totaled 117 short tons as compared with 267 tons in November 1953, according to a U. S. Embassy dispatch (December 21, 1954) from Panama.

Republic of the Philippines

NEW FISH CANNERY: Negotiations for the establishment of a $1 million fish cannery in the Philippines were expected to be concluded late in December 1954 according to the December 14, 1954 New York Journal of Commerce. The newly-formed company is composed of Japanese, Philippine, and United States businessmen. The company would operate its own deep-sea fishing fleet. Construction of the cannery was expected to begin early in 1955.

Portugal

FISH CANNING TRENDS, JULY-SEPTEMBER 1954: The Portuguese fish canners enjoyed in October 1954 a more comfortable position than at any time during the past years, especially in the north. The markets for sardines in Western Germany and the United Kingdom were relatively strong and the sardine catch was expected to be good the remainder of the year, although fresh fish prices were still high. Unfortunately, the anchovy and tuna catches were well below normal, largely nullifying the good sardine season for the southern canners, an October 27, 1954, U. S. Embassy dispatch from Lisbon reports.

Launching of one of the new 45-meter trawlers constructed in Portugal for long-range fishing off the west coast of Africa.

Up to the end of August 1954 the scarcity of sardines in Northern Portugal continued. In September, however, catches improved somewhat and the canning industry was kept moderately active. Factories were reported to be finding a ready market for their output and production was being fully exported, principally to the United Kingdom, Belgium, Germany, Italy, and Syria. Prices were reported to be showing a rising trend. On the other

hand, fresh fish prices rose 67 percent since the first part of 1954. It was doubted if the improved export picture compensated for the rise in the price of raw material.

AZORES FISHING AND WHALING: According to a leading Azores fish-packing company, the fish catch in the 1954 season was very poor, principally for the lack of tuna and albacore which normally keep factories at full-time operation. To mitigate the situation of fishermen of Ponta Delgada district, local authorities have authorized the enforcement of the winter retail price tariff on fish.

The whaling industry also claims a very low catch in 1954 because unfavorable misty weather rendered watches for passing whales impracticable much of the time.

Spain

VIGO FISHERIES TRENDS, SEPTEMBER 1954: Landings: Fish catches in the Vigo area of Spain during September 1954 increased substantially over the previous month and also September 1953, reports a U. S. consular dispatch (October 8) from Vigo.

The increase was the result of large seasonal catches of jurel--an inexpensive fish which must be sold in the local fresh fish markets since there is little industrial demand for this variety. Prices--0.85 pesetas per kilo ($\frac{1}{3}$ U. S. cent per pound)--obtained for this specimen are reported to have barely covered operating costs. Albacore catches continued to be encouraging. Substantial quantities (881 metric tons) of albacore were landed at the canneries at 8.52 pesetas per kilo (3.5 U. S. cents per pound).

Fish Canning: Activity in the District's fish-canning industry picked up during September 1954. This improvement is clearly shown by the fact that the industry purchased during September 6.9 million pounds of fish (mainly albacore and sardines) as against 3.0 million pounds in the previous month and 2.9 million pounds in September 1953.

Packers indicate that the increase in September 1954 is estimated at roughly 60 percent over that of the previous month, but that in general, operations did not reach more than 30 percent of capacity.

Higher Exchange Rate: The new export exchange rate of US$1.00 equals 33.835 pesetas applicable to all canned fish exports which was established in July 1954, together with the right to retain 20 percent of the sales in foreign currency for the purchase of equipment and supplies, has had a certain encouraging effect. But the measure is considered insufficient to enable the industry to resume competition abroad. Under the circumstances the situation remains uncertain, although better than a year ago.

Sweden

FOREIGN TRADE IN FISHERY PRODUCTS, 1953/54: Total Swedish exports of fishery products in 1953/54 (September-August) amounted to 56,000 metric tons, while imports in the same period totaled 34,800 tons.

Swedish fishery products imports required during 1954/55 are estimated at 30,000 metric tons and the exportable surplus estimated at 52,000 tons, reports a November 12, 1954, U. S. Embassy dispatch from Stockholm.

Switzerland

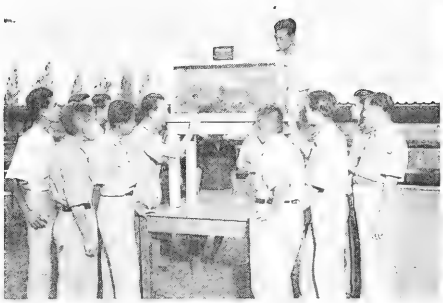
FISH CONSUMPTION, 1953/54: The per-capita consumption of fish in Switzerland during 1953/54 (August-July) amounted to $5\frac{1}{2}$ pounds per person, according to a November 4 U. S. Embassy dispatch from Bern. Total consumption during the period amounted to about 11,000 metric tons, and it is estimated that the requirements for 1954/55 will be the same.

Thailand

FISHERIES TRENDS, 1953/54: Next to rice, fish is the most important source of food supply in Thailand, states a dispatch (November 15, 1954) from the U. S. Embassy at Bangkok. Fish are abundant and taken in large quantities in the extensive coastal waters of the Gulf of Siam; in the central plain where flooded fields yield fish as well as rice; and in all of Thailand's innumerable inland streams and ponds. Over 2,000 species of fish and shellfish are utilized for food in one form or another. Although only 50,000 workers are listed in Thailand's latest census as being full-time fishermen, it is safe to say that at least 5 million people spend a part of their time fishing. Many farmers spend more time fishing than they do on land.

Tilapia, the fast-growing pond fish, native of Africa, is the most important pond species in Thailand. Tilapia fry seek shelter in their mother's mouth when they are frightened. Here a group of fry are swimming for safety, alarmed by the photographer's flash.

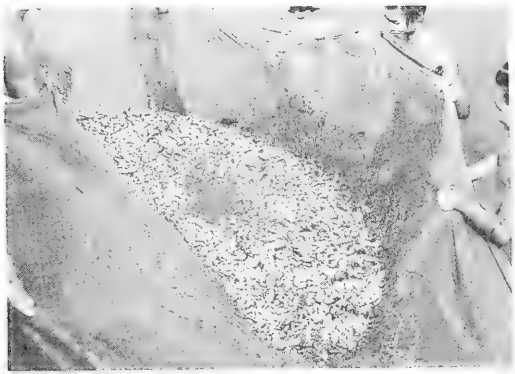
The Thai Government recognizes the importance of fish in the daily diet of its citizens and carries on an extensive program for the improvement of pond fisheries



Characteristics of Tilapia fish shown to Thai fisheries representatives meeting at Bankhen Experiment Station. Visiting expert Dr. S. W. Ling (holding pipe, center) is briefing provincial fisheries officers and village chiefs on distribution of fingerlings to Thai farmers, one of the steps in fish pond culture projects being advised by technical assistance experts of the Food and Agriculture Organization of the United Nations (FAO).

FAO's Fish culturist, Dr. S. W. Ling, demonstrates to Thai trainees at the Freshwater Fish-Culture Training Course the use of plastic bag--newest method of transporting fingerlings for distribution. Fish and water are put in bag which is then filled with oxygen and sealed.

in order to make fish available to as many people as possible. The Thai Fisheries Department is well equipped for the production and distribution of fingerlings of various species, and this is one of the most popular forms of public service performed by the Government.



Tilapia fingerlings in net, caught for distribution to Thai farmers.

According to the Thai press (Pim Thai, November 2, 1954): "Since 1949 Thailand has been exporting salt fish in big quantities and her best customer has been Indonesia, which formerly made purchases through Hong Kong and Sinapore." The article goes on to explain that Thailand's fish trade with Indonesia has fallen off lately because Indonesia now lacks foreign currency to purchase in as large quantities as formerly. A report from the Economic Section of the Indonesian Legation in Bangkok states that from January-June 1954 Indonesia purchased 17,036 metric tons of salted fish from Thailand, valued at an estimated 36,656,714 rupiahs (US$3.2 million).

The Thai Government has developed a new food product to utilize unsaleable fresh-fish surpluses; this is being advertised under the name of "Tasty Fish Powder." This product is intended for use as a condiment and consists of powdered fish meal to which salt and chili has been added. One hundred thousand sample packages of this product were prepared for free distribution at the Constitutional Fair held in Bangkok during December 1954.

Union of South Africa

PREVENTATIVE FOUND FOR STRUVITE IN CANNED SPINY LOBSTER: The formation of struvite in canned spiny lobster can be prevented by a substance (sodium hexmetaphosphate) which is used in boiler water to prevent scaling, the Fishing Industry Research Institute found after considerable research. The struvite is composed of glass-like magnesium-ammonium-phosphate crystals that are harmless enough and easily digested, but they tend to alarm the consumer, reports the October 1954 South African Shipping News and Fishing Industry Review.

By adding a small amount of sodium hexametaphosphate to the can, a soluble complex was formed which did not develop into crystals and in no way impaired smell or taste. (The same remedy has been found in the United States and the manufacturers patented the use of sodium hexametaphosphate for the prevention of struvite.)

A South African firm, however, concluded an agreement with a Massachusetts firm which holds the patent. As the result of the agreement, hexametaphosphate is under the brand name of Polyphos and is available to South African spiny lobster canners.

Union of South Africa+South-West Africa

PILCHARD FISHERY RESEARCH TO BE EXPANDED: Developments which may vitally affect the pilchard and maasbanker fishery of the Cape west coast and the pilchard industry of Walvis Bay in South-West Africa, were being planned by the Division of Fisheries, according to the October South African Shipping News and Fishing Industry Review. In cooperation with the industry, the Fisheries Development Corporation of South Africa, Ltd., and the South-West Administration, the Division is to build three new research vessels, increase its scientific staff, and build new laboratories in Cape Town and on the west coast of South Africa.

The new fisheries research scheme, which is to accelerate research into the vital pilchard and maasbanker resource, was announced in the Fourth Progress Report of the pilchard research program.

In his summary of findings and conclusions, the Union of South Africa Director of Fisheries observes that in four years of intensive investigations the research vessels have found no area of concentrated pilchard spawning. The coverage was too thorough to have missed "any such spawning focus" and so "the question arises, where do the recruits come from to sustain the large pilchard population found in Union waters?"

The report then suggests the remarkable possibility that the pilchards may spawn northwest of Walvis Bay, that the eggs would move with the prevailing current, and, when they hatched, the larvae would also move with the current until they developed sufficiently to move independently. Investigations in other parts of the world have shown that pilchards tend to swim against the general direction of sea currents and so it may be possible that the young pilchards reverse their previous drift and swim south past Walvis Bay to St. Helena Bay. It has been established that the Union and South-West species are identical, that the Walvis pilchards are younger than those caught in the Union, and that predatory fish such as snoek, known to follow pilchard shoals, have been tagged in the Walvis area and later recovered off the west coast of the Union.

It has thus become vital to find, through practical research, whether South-West Africa and the Union are exploiting one and the same resource, says the report.

It also indicates that the present conservation policies can be interim only and so the work of accurately assessing the fish resource must be speeded up. The formulation of an adequate policy of conservation, however, depends directly on what is known of the inter-relation of the Union and South-West African pilchard fisheries. "This alone is a strong enough reason for integration of the researches of South-West Africa and the Union."

Thus the program should be increased, the research work of the Union and South-West should be integrated, and priority must be given to the tagging of pilchards "as this is the only practical means of determining the migration of the fish."

To carry out the new program, a capital sum of £175,000 (US$487,000) is to be obtained from a loan serviced by the Fisheries Development Corporation of South Africa, Ltd. The annual payments of interest and capital redemption on this loan are to be covered by a compulsory levy on the pilchard and maasbanker fishing industry. This levy is to be assessed on the tonnage of fish caught and will be met both by factories and by fishermen.

The recurrent expenditure on the augmented program will total about £25,000 (US$67,000) and will be met from Union and South-West revenue funds on a pro-rata basis to be decided. This sum will cover the running expenses of an extra research vessel, salaries, wages, and allowances for 10 additional research officers, and extra scientific apparatus and equipment.

With the £175,000 (US$487,000) loan, the Division of Fisheries will replace the now obsolete research vessels Schipa and Palinurus. Two new boats will be built at a cost of £35,000 (US$97,000) each. They are to be 75 feet long and modeled on the United States purse-seiner design. Modified to meet the requirements of a research vessel, the two new boats will carry out the inshore research work.

The third boat will be 100 feet long of the same design and will cost about £85,000 (US$237,000). This vessel will do the offshore research work and so release the Africana II for basic oceanographic work.

The remaining £20,000 (US$56,000) of the loan will be spent on additional laboratory accommodations at the Division's headquarters at Sea Point and on a properly-equipped laboratory at the present Stompneus field station.

U.S.S.R.

URGENT PROBLEMS OF THE FISHING INDUSTRY: The Soviet Government planned and is accomplishing in 1954 a program of sharp increase in the production of food products and the improvement of quality. Great and responsible tasks have been placed before the fishing industry with regard to this decided increase in the production of food products, according to the Moscow press (Pravda, March 30, 1954).

During recent years the fishing industry received a great number of fishing, transport, and receiving fleets which were equipped with modern machinery. The number of fish-processing enterprises, canneries, and refrigeration plants was increased. Port facilities were expanded, considerably increasing labor mechanization in unloading and fish processing.

The creation of a large sea- and ocean-fishing fleet permitted the mastery of new fishing regions. For example, in 1947, 900 metric tons of herring were caught by Soviet fishermen in the North Atlantic, and in 1953 more than 100,000 metric tons were caught. The herring catch in the Sea of Okhotsk also increased during this period.

However, as of March 29, 1954, the rate of increase in the fish catch was far from satisfactory. The U. S. S. R. fishery industry has not fulfilled its state plans for a number of years.

What are the reasons for this lag in the fish industry? First of all, the operation of the fishing fleet was inefficiently directed. Up to March 29, 1954, the idle time of boats being repaired, unloaded, or refueled had been unreasonably great. Boat wrecks were allowed and the schedule for operation at sea established for the boats was not followed. By March 1954 the necessary working and state discipline had still not been applied in the fishing fleet. There was a continual cadre turnover.

In March 1954 the Murmansk Trawler Fleet, the fishing fleet of Glavrybsakhprom (Main Administration of Fish Industry in Sakhalinskaya Oblast), and the Krymskaya Oblast Trust were operating unsatisfactorily.

Fishing kolkhozes play an important part in the U. S. S. R. fish catch. In March 1954 almost all of them were serviced by Motorized Fishing Stations. However, the main administrations of the fishing industry were not devoting the necessary attention to the stations. Many stations were not fulfilling fishing plans and were not becoming true organizers of kolkhoz fishing. At that time there were not enough persons with higher and secondary specialized educations among leaders, and engineering and technical workers of stations.

During recent years workers of the fishing industry eased up in their efforts to increase the catch of the more valuable fish, such as river salmon in the Barentsovo Sea, winter dorse in the White Sea, eels in the Baltic Sea, chinook in Kamchatka waters, etc. While absorbed in catching sprat and anchovies, fishermen of the Caspian and Azov-Black Sea basins relaxed in their efforts to catch large net fish--Kerchenskiy herring, rybets, and shemaya.

In March 1954 work was being conducted inefficiently even for production of high-quality products of the most valuable types of fish. For example, the Kol'skiy Trust was processing river salmon, chiefly in the highly salted form. In 1953 fishing organizations of the Caspian Basin processed 22.5 percent of its total pike-perch catch in the highly salted form. Too often, industry enterprises were salting fish and forgetting all about other methods of processing fish. In 1953 the fishing industry completely fulfilled the fish-salting production plan. At the same time the industry fell short of plan quotas for canned fish by 12 percent, smoked fish by 16 percent, and frozen fish by 32 percent.

The successful solution to problems of the fish industry greatly depends on the timely fulfillment of a large volume of capital construction. In March 1954 the situation was bad regarding the construction of new enterprises and putting them into operation. Construction was particularly lagging in refrigeration plants and salting facilities in the Far East, in plants for artificial breeding of commercial fish in the Caspian and Azov-Don basins, and in living quarters in Murmanskaya Oblast, Kakhalin, and Kamchatka.

The most important task for improving the operation of the fishing fleet in 1954 is to eliminate the idle time of fishing boats. It is necessary to obtain a larger fish catch from each vessel by utilizing the methods of outstanding crews. It is very important to master new fishing regions and to improve fishing explorations. To do this it will be necessary to increase the number of research boats and to equip them with the latest navigational techniques, hydroaccoustical devices, and radio communication facilities.

The Soviet fishing industry has rich reserves available. To bring these reserves into use it is necessary first of all to raise the productivity of lagging fishing boats to the level of outstanding ones. The need for improvement along this line can be

seen in the following data. In 1953 the trawler Kirov of the Murmansk Trawler Fleet caught 4,700 metric tons of fish. At the same time the trawler Anadyr', operating under the same conditions and having equal capacity and fishing gear, caught only 3,300 metric tons. During the year Trawler No. 189 (average-size trawler) caught 1,000 metric tons, of herring, while a similar trawler, No. 838, caught only 560 metric tons. The Astrakhanets, a seiner in the Caspian Sea, caught 530 metric tons of fish, while its sistership, No. 810, caught only 210 metric tons.

The fish catch must also be increased by perfecting fishing equipment, particularly the trawl; by increasing storm-resistance of stationary sea nets; and by completely mechanizing river net fishing, particularly in the Volga, Don, Ural, and the rivers of Siberia and the Far East. At the same time work of the fish-receiving fleet must be improved and unloading piers must be mechanized.

In March 1954 intensified preparation for the spring fishing season was under way in all fishing basins. For many basins, this season is of decisive importance and actually determines the fulfillment of the yearly fishing plan. But, in March many fishing organizations were lagging in their preparations for the season.

In March 1954 the following organizations were slowly reconditioning the fleet, refrigeration plants, and canneries: Glavkasprybprom (Main Administration of Fish Industry in the Caspian Basin); Glavprimorrybprom (Main Administration of Fish Industry in Primorskiy Kray); and the Ministry of Food Products Industry Latvian SSR. Many main administrations and trusts were obtaining ice inefficiently, and conducting operations for building and repair of fishing equipment in an inefficient manner.

An urgent task, to catch 26 percent more fish than in 1953, confronts the fishing industry and fishing kolkhoz workers in the form of the 1954 plan.

Production of fishery products of improved assortment must increase considerably. In 1954 production of refrigerated fish is to increase 54.1 percent, frozen fish by 68.5 percent, frozen fillets by 64.2 percent, salted herring by 48.6 percent, cured and dried fish by 55.2 percent, smoked fish by 44.4 percent, and cured fillets by 59.1 percent.

The success of the struggle for an all-around increase in the fish catch greatly depends on how problems concerning further technical equipping of the fishing industry will be decided in the central apparatus of the Ministry of Food Products Industry USSR and how aid will be given to production organizations. In March there were many shortcomings in this respect. Up to this time ministry administrations directed the fishing industry operation by bureaucratic methods, not deciding problems of its development for months. For example, the Main Administration of Food Industry Supply, the Fleet Administration, the Working Cadres, Labor and Wages Administration, and the Technical Administration violated established time periods for fulfilling a number of important assignments connected with further development of the fishing industry.

By March 1954 the political administration of the fishing industry fleet had been set up in the Ministry of Food Products Industry USSR. This unit was called on to organize mass political work among crew members of the fishing and transport fleet directed toward strengthening the state and labor discipline, utilization of experience of foremost crews, and elimination of work stoppages and boat wrecks.

The fish industry needs aid from a number of ministries and departments. The Ministry of Ferrous Metallurgy USSR must assure timely shipment of wire hawser, which is extremely important in the operation of trawlers. Irregularity of wire hawser shipments leads to work stoppages of large fishing boats. Moreover, the Ministry of Ferrous Metallurgy must improve the quality of tin which it supplies to the canneries, and must set up production of rolled prime tin plate. The Ministry of Maritime and River Fleet USSR is to allot the necessary number of boats for

servicing herring fishing facilities in the North Atlantic, and improve freight transfer for the fishing industry and export of fish from enterprises of the Far East. Freight transfer for the spring fishing season and the smooth shipment of fishery products, particularly from such points as Murmansk, Astrakhan, Kaliningrad, and others, greatly depends on the Ministry of Railways.

In March 1954 the Ministry of Construction was unsatisfactorily conducting work for the fishing industry. A number of important construction projects were dragged out over a long period of time through the fault of the Ministry. Up to this time the Ministry of Timer and Paper Industry USSR was inadequately supplying lumber, and by March lumber shipments were particularly poor. The Ministry of Consumer Goods Industry USSR was not supplying the demand of seine-knitting factories for capron fiber used in the manufacture of fishing equipment.

It is necessary to improve the organization of fishing kolkhoz labor and to stiffen the discipline in fishing kolkhozes. Local party and Soviet organizations must aid the fishing industry on this matter. The fishing section of Tsentrosoyuz (Central Council of Consumer Cooperatives) must improve trade and public catering in fishery regions, and particularly in fishing sectors and on distant expeditions.

In March 1954 the fishing industry was taking every measure to fulfill the assignments placed on it by the party and the Government to increase the fish catch, expand production, and improve the quality of fishery products.

United Kingdom

COLD-STORAGE INDUSTRY DECONTROLLED: The cold-storage industry of the United Kingdom, which has been under Government control since September 1939, was returned to private hands on December 24, 1954. At that time storage facilities acquired during and since World War II were to be operated jointly by a management company of Government and industry representatives. Details of the program have been discussed between the industry and the Ministry of Food.

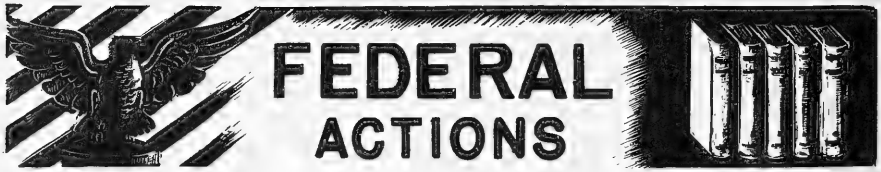
During the war 47 facilities having 15 million cubic feet of frozen space were built by the Government. In addition all private facilities larger than 5,000 cubic feet were licensed; the Ministry controlled the use of the plants and set the storage rates. Now that derationing of all cold-storage items has been completed there is little justification for control of the industry by the Government.

The Government-built plants will be maintained for use in case of emergency and will be used by the industry as required, according to the November 22, 1954, Foreign Crops and Markets, a Department of Agriculture publication.

Uruguay

CONSIDERS JURISDICTION OVER CONTINENTAL SHELF: A member of the Uruguayan National Council of Government on November 9, 1954, expressed before the Council his opinion that the Council should issue a decree declaring that the Uruguayan Government was sovereign over the waters extending outward to the edge of the continental shelf, but that such a declaration should refer only to the conservation, exploitation, and use of the natural resources it contains.

Following the Counselor's statement the Council referred the question for advice to the Ministries of Foreign Relations, National Defense, and Industries and Labor, a November 10, 1954, U. S. Embassy dispatch from Montevideo reports.



Department of Commerce

BUREAU OF THE CENSUS

FROZEN FILLET BLOCKS OR SLABS TO BE LISTED SEPARATELY IN IMPORT STATISTICS:

Frozen fish fillet blocks or slabs for use in fish sticks or other uniform portions, effective January 1, 1955, will be shown as a separate item in the statistics on imports published by the Bureau of the Census, according to the December 1954 Foreign Trade Statistics Notes from that agency. This relatively new commodity has been included with various other categories since first introduced. It has now been assigned a new Schedule A commodity number as follows:

New Schedule A Classification and Description	Schedule A Commodity No.
Fish and fish products:	
Frozen blocks or slabs made from fillets of cod, haddock, hake, pollock, cusk, and Atlantic ocean perch (rosefish), compressed for use in the manufacture of fish sticks or other uniform portions (formerly part of 0060 110, 0060 150, and 0060 190)	0060 200

Importers and brokers are requested by the Bureau of the Census to take steps to insure the use of this new Schedule A commodity classification for frozen fillet blocks or slabs after January 1, 1955. This will prevent the additional cost in the rehandling of import entries by Census, Customs, importers, and brokers which could result from not describing the merchandise in terms of the new reporting requirements.

In order to prevent any delay in filing of import entries of frozen fillet blocks or slabs, importers should refer to P.B. A-3 before preparing entries filed on and after January 1, 1955.

Foreign Operations Administration

FISHERY PRODUCTS FOR INDOCHINA:

The Office of Small Business, Foreign Operations Administration, announced on January 26, 1955, requests for funds to finance the purchase of fishery products in the value of US$200,000 for Vietnam, and US$160,000 for Cambodia. These products were to be purchased by commercial firms in Vietnam and Cambodia, Indochina, to the extent that purchase authorizations are issued.

Department of the Interior

FISH AND WILDLIFE SERVICE

NEW REGIONAL POSITIONS:

A number of appointments to newly created key positions in the Service were announced by Secretary of the Interior McKay on November 26, 1954. The establishment of these new positions in the five regional offices of the Service in the United States is part of the Service's administrative reorganization as recommended by a Survey Team appointed by Secretary McKay March 1954. All of the positions were filled by promotions or reassignments of Service personnel.

The report of the Survey Team recommended that the Service's organizational structure be changed to place it on a line and staff basis and all major functions be regionalized except that of fundamental research.

In the Central Office of the Service, the Office of the Director has been reorganized to include an assistant director for wildlife, one for fisheries, and one

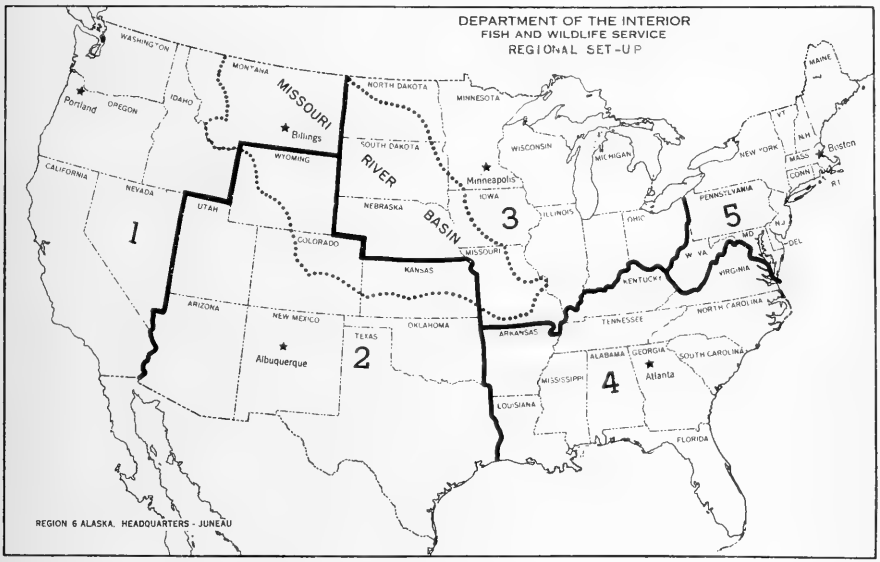
for field operations, as well as two assistants to the Director for administrative staff services and technical staff services, respectively.

To effect these changes at the regional level, regional activities are now divided under the headings of Administrative Staff Services, including Budget and Management, Personnel, and Finance and Procurement; Technical Staff Services, including River Basin studies, Federal Aid, Lands, and Engineering; Wildlife Division, including Wildlife Research, Game Management, Refuges, and Predator and Rodent Control; and Fisheries Division, including Fisheries Research, Commercial Fisheries, and Hatcheries.

The number and location of regional offices remain the same, and the present Regional Directors retain their posts. All Assistant Regional Directors remain in their same regions, with a reassignment of duties. Three members of the Central Office staff are being transferred to regional office posts.

Key staffing of the five United States regional offices under the reorganization will be as follows:

Region 1, Portland, Oregon: Regional Director, Leo L. Laythe; Administrative Officer in charge of Administrative Staff Services, Ben Hundley; Assistant Regional Director in charge of Technical Staff



Regional personnel in charge of the Technical Staff Services, Wildlife Division, and the Fisheries Division will carry the title of Assistant Regional Directors. The Administrative Officer, in charge of Administrative Staff Service, will continue to be designated by that title. Regional Directors will serve as liaison officers with the Assistant Director for Field Operations in the Central Office.

Services, Joseph T. Barnaby; Assistant Regional Director in charge of Wildlife, Paul T. Quick; and Assistant Regional Director in charge of Fisheries, Samuel J. Hutchinson. Barnaby has been Regional Fishery Management Biologist.

Region 2, Albuquerque, New Mexico: Regional Director, John C. Gatlin; Administrative Officer in charge of Administrative Staff Services, Harold O. Crowley; Assistant Regional Director in charge

of Technical Staff Services, Kenner C. Kartchner; Assistant Regional Director in charge of Wildlife, William T. Krummes. At the present time fisheries functions in this region will be assigned to Krummes. Krummes is transferring to Albuquerque from the Central Office where he is now Assistant Chief of the Branch of Wildlife Refuges.

Region 3, Minneapolis, Minnesota. Regional Director, Daniel H. Janzen; Administrative Officer in charge of Administrative Staff Services, Andrew J. Meyer; Assistant Regional Director in charge of Technical Staff Services, Samuel E. Jorgensen; Assistant Regional Director in charge of Wildlife, Robert W. Burwell. For the present, fisheries functions in Region 3 will be handled by Burwell. Jorgensen has been Regional Supervisor of Federal Aid.

Region 4, Atlanta, Georgia: Regional Director, Walter A. Gresh; Administrative Officer in charge of Administrative Staff Services, Lester E. Scherer; Assistant Regional Director in charge of Technical Staff Services, Carl R. Eklund; Assistant Regional Director in charge of Wildlife, Hugh W. Terhune; and Assistant Regional Director in charge of Fisheries, Dr. Willis King. Eklund, now Wildlife Research Biologist, Office of River Basin Studies, and King, Fishery Management Biologist, Branch of Federal Aid, will transfer to Atlanta from the Central Office.

Region 5, Boston, Massachusetts: Regional Director, David R. Gascoyne; Administrative Officer in charge of Administrative Staff Services; David Wood, Jr.; Assistant Regional Director in charge of Technical Staff Services, Edward W. Bailey; Assistant Regional Director in charge of Wildlife, Allen Studholme; and Assistant Regional Director in charge of Fisheries, Joseph F. Puncochar. Studholme has been Regional Supervisor of Federal Aid, and Puncochar has been in charge of the Service's Fishery Technological Laboratory at East Boston, Mass.

Treasury Department

BUREAU OF CUSTOMS

GROUNDFISH FILLET IMPORT TARIFF-RATE QUOTA FOR 1955:

The reduced-tariff-rate import quota on fresh and frozen groundfish (cod, haddock, hake, pollock, cusk, and ocean perch or rosefish) fillets for calendar year 1955 is 35,432,624 pounds, the Bureau of Customs announced in the February 2, 1955, Federal Register. Divided into quarterly quotas this means that 8,858,156 pounds of groundfish fillets during each quarter may be imported at the $1\frac{7}{8}$ cents-per-pound rate of duty. During each quarter, groundfish fillet imports over the quarterly quota will be dutiable at the rate of $2\frac{1}{2}$ cents per pound.

The reduced-rate import quota for 1955 is 4.4 percent higher than the 1954 quota of 33,950,386 pounds and substantially higher than the 1953 quota of 33,866,287 pounds, the 1952 quota of 31,472,108 pounds, and the 29,289,808-pound quota of 1951.

Average aggregate apparent annual consumption in the United States of fresh or frozen groundfish fillets and steaks (including the fillet blocks and slabs used in the manufacture of fish sticks) for the three years preceding 1955 (1952-54) was 236,217,495 pounds, calculated in accordance with the proviso to item 717 (b) of Part I, Schedule XX, of the General Agreement on Tariffs and Trade (T. D. 51802). The proviso states that the import quota for any current calendar year shall be 15,000,000 pounds or 15 percent of the average aggregate apparent annual consumption in the three years preceding the current year, whichever is greater. The tariff item in summarized form is: "Fish, fresh, or frozen (whether or not packed in ice), filleted, skinned, boned, sliced, or divided into portions, not specially provided for: Cod, haddock, hake, pollock, cusk, and rosefish (ocean perch)." Fillet blocks and slabs for making fish sticks are also included under this category.

The full text of the announcement as it appeared in the Federal Register (February 2) is as follows:

The tariff-rate quota for the calendar year 1955 on certain fish dutiable under paragraph 717 (b), Tariff Act of 1930, as modified pursuant to the General Agreement on Tariffs and Trade (T. D. 51802).

In accordance with the proviso to item 717 (b) of Part I, Schedule XX, of the General Agreement on Tariffs and Trade (T. D. 51802), it has been ascertained that the average aggregate apparent annual consumption in the United States of fish, fresh or frozen (whether or not packed in ice), filleted, skinned, boned, sliced, or divided into portions, not specially provided for: Cod, haddock, hake, pollock, cusk, and rosefish, in the three years preceding 1955, calculated in the manner provided for in the cited agreement, was 236,217,495 pounds. The quantity of such fish that may be imported for consumption during the calendar year 1955 at the reduced rate of duty established pursuant to that agreement is, therefore, 35,432,624 pounds.

[SEAL] **D. B. STRUBINGER,**
Acting Commissioner of Customs.

Average aggregate apparent annual consumption in the United States of fresh or frozen groundfish fillets and steaks for the three years 1951-53 was 226,335,907 pounds, 4.4 percent less than the consumption for the period 1952-54. The increase in imports for groundfish fillets during the latter period was due to the increased imports of fillet blocks and slabs in 1954 for the manufacture of fish sticks.

Fish-stick production in 1954 reached 50 million pounds. These sticks were produced largely from imported cod fillet blocks and slabs.

Eighty-Fourth Congress (First Session)

JANUARY 1955:

The First Session of the Eighty-Fourth Congress convened on January 5, 1955.

Listed below are public bills and resolutions introduced and referred to committees or passed by the Eighty-Fourth Congress (First 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 when introduced and, if passed, when signed by the President; but also shown from month to month are the more pertinent reports, hearings, or chamber actions on some of the bills.

PRESIDENT'S STATE OF THE UNION MESSAGE: In his State of the Union Message, the President made the following statements and recommendations on the following subjects of interest to the fishery and allied industries:

International Trade: ". . .We must expand international trade and investment and assist friendly nations whose own best efforts are still insufficient to provide the strength essential to the security of the free world. . . .

". . .Barriers still impede trade and the flow of capital needed to develop each nation's human and material resources. Wide reduction of these barriers is a long-term objective of our foreign economic policy--a policy of an evolutionary and selective nature, assuring broad benefits to our own and to other peoples.

"We must gradually reduce certain tariff obstacles to trade. These actions should, of course, be accompanied by a similar lowering of trade barriers by other nations, so that we may move steadily together toward economic advantages for all. We must further simplify our customs procedures..."

Fisheries: "Continued vigilance will be maintained over our fisheries, wildlife resources,. . ."

Food: "Better consumer protection under our existing pure food and drug laws;. . . ."

Pollution: "Strengthened programs to combat the increasingly serious pollution of our rivers and streams and the growing problems of air pollution."

Labor: ". . .in the past 5 years we have had economic growth which will support an increase in the Federal minimum wage. In the light of present economic conditions, I recommend its increase to 90 cents an hour. I also recommend that many others, at present excluded, be given the protection of a minimum wage."

Statehood: "As the complex problems of Alaska are resolved, that Territory should be expected to achieve statehood. In the meantime, there is no justification for deferring the admission to statehood of Hawaii. I again urge approval of this measure. . . . ."

ALASKA FISHERIES CONTROL TO TERRITORY: H.R. 244 (Bartlett), introduced January 5. A bill to amend the Organic Act of the Territory of Alaska, and for other purposes; to the Committee on Interior and Insular Affairs. This bill would transfer the control and regulation of Alaska fisheries and game resources, except the fur-seal and sea-otter fisheries, from the Department of the Interior to the Territory of Alaska. The bill provides in part:

". . .That the first proviso of section 3 of the Act of August 24, 1912 (37 Stat. 512), entitled "An Act to create a legislative assembly in the Territory of Alaska, to confer legislative power thereon, and for other purposes" is hereby amended by striking out the words "fish" and "game" appearing therein; and that any other Federal limitations upon the legislative power of the Legislature of the Territory of Alaska with respect to the control and regulation of the fisheries and game resources of Alaska, except those which may

be contained in the succeeding sections of this Act, are hereby expressly replaced.

"Sec. 2. The jurisdiction, supervision, administration, and control over the salmon and other fisheries and game of Alaska, heretofore and now vested in the Department of the Interior, be, and they hereby are, transferred to and vested in the Territory of Alaska, to be exercised by the Territorial legislature thereof in the manner hereinafter provided: Provided, however, that the authority and jurisdiction hereby conferred upon the Territory of Alaska shall not extend to the fur-seal or sea-otter fisheries, nor to the supervision or control of the Pribilof Islands, including the islands of Saint Paul and Saint George, Walrus and Otter Islands, and Sea Lion Rock, in Alaska, but that such authority and jurisdiction over the said fur-seal and sea-otter fisheries, and supervision and control of the said Pribilof Islands, shall remain with the Federal Government. . . .

"Sec. 4 (a) The administrative authority hereby vested in the Territory of Alaska shall not become effective until the legislature of the said Territory shall, at any regular or extra session, accept jurisdiction of the administrative and regulatory functions over the fisheries and game of Alaska hereby transferred to and vested in the Territory of Alaska, and shall make provision by law for the administration and regulation therof, as well as provision for defraying the necessary expenses of such administration, regulation, protection, and conservation of such fisheries and game. . . .

"Sec. 8. (a) Any and all property of the United States under the supervision and control of the United States Fish and Wildlife Service and the Alaska Game Commission heretofore or now used exclusively in connection with the administration, supervision, and control of the fisheries and game of Alaska, for use in connection with the administration of the said fisheries and game by the Territory, shall be transferred by the Secretary of the Interior to the Territory of Alaska, such transfer to be made only after the administration of the said fisheries and game is accepted by the Territory in the manner hereinabove provided.

"(b) The property to be transferred shall include any and all books, papers, and documents of a scientific nature dealing with the fisheries and game of Alaska, as well as scientific equipment heretofore and now used exclusively in connection with the administration of the Alaska fisheries and game. From and after the date of such transfer of any of said property to the Territory, the cost of maintenance thereof shall be borne by the Territory. Delivery of any property transferred hereunder shall be without expense to the United States, but shall be made at such times and places as may be most convenient to both the United States and to the Territory of Alaska.

"Sec. 9. From and after the passage and approval of this Act, 50 per centum of the net proceeds accruing to the United States of America from the sale or sales of sealskins held under the provisions of the Act of April 21, 1910 (36 Stat. L. 326), and of the Act of February 26, 1944 (58 Stat. 100), as amended, shall be annually paid by the Treasurer of the United States to the Territory of Alaska, to be used by the Territory only for the purpose of defraying the cost of protecting and conserving the fisheries and game of Alaska and of administering and supervising the same."

ALASKA NET REGULATIONS: H. R. 249 (Bartlett), introduced January 5. A bill relating to the regulation of nets in Alaska waters; to the Committee on Merchant Marine and fisheries. The bill provides: "It shall be unlawful to lay or set any seine or net of any kind within one hundred yards of any other seine, net, or other fishing appliance which is being or which has been laid or set in any of the waters of Alaska, or to drive or to construct any trap or any other fixed fishing appliance, except a set net, stake net, or anchored gill net, within six hundred yards laterally or within one hundred yards endwise of any other trap or fixed fishing appliance."

Also S. 456 (Magnuson), introduced January 14, similar to H. R. 249.

ALASKA STATEHOOD: H. R. 185 (Saylor), introduced January 5. A bill to provide for the admission of Alaska into the Union; to the Committee on Interior and Insular Affairs.

Also introduced January 5 H. R. 248 (Bartlett), H. R. 511 (Engle), H. R. 825 (Mack of Wash.); and S. 452 (Langlee) introduced January 14; all similar to H. R. 185. These bills provide in part:

"Sec. 3 . . .That said State (Alaska) and its people do agree and declare that they forever disclaim all right and title to any lands or other property not granted or confirmed to the State or its political subdivisions by or under the authority of this Act, the right or title to which is held by the United States or is subject to disposition by the United States, and to any lands or other property (including fishing rights), the right or title to which may be held by any Indians, Eskimos, or Aleuts (hereinafter called natives) or is held by the United States in trust for said natives;. . . .

"Sec. . . .(g) All real and personal property of the United States situated in the Territory of Alaska which is specifically used for the sole purpose of conservation and protection of the fisheries and wildlife of Alaska, under the provisions of the Alaska game law of July 1, 1943 (57 Stat. 301; 48 U. S. C., secs. 192-211), as amended, and under the provisions of the Alaska commercial fisheries laws of June 26, 1906 (34 Stat. 478; 48 U. S. C., secs. 230-239 and 241-242), and June 6, 1924 (43 Stat. 465; 48 U. S. C., secs. 221-228), as supplemented and amended, shall be transferred and conveyed to the State of Alaska by the appropriate Federal agency: Provided, That such transfer shall not include lands withdrawn or otherwise set apart as refuges or reservations for the protection of wildlife nor facilities utilized in connection therewith, or in connection with general research activities relating to fisheries or wildlife. The rights of the State of Alaska over fisheries and wildlife shall not be construed to include control over fur seals, sea otters, and such other fish and wildlife resources as are protected under the provisions of international agreements. At the close of each fiscal year, commencing with the year during which Alaska is admitted into the Union, the Secretary of the Treasury shall pay to the State of Alaska 50 per centum of the net proceeds, as determined by the Secretary of the Interior, derived during such fiscal year from all sales of sealskins or sea otter skins made in accordance with the provisions of the Act of February 26, 1944 (58 Stat. 100; 16 U. S. C., secs. 631a-631q), as supplemented and amended. . . .

"(k) The portion of the proceeds of the sales of public lands, of sales of seal or sea otter skins, of oil royalties, and other such revenues derived by the Federal Government from the sale or lease of resources within the State, which are not paid over to the State, or heretofore or hereafter authorized by the Congress to be appropriated or expended for a specific purpose, pursuant to the terms of this or any other Act, shall be deposited in the Treasury of the United States in a special fund and shall be devoted only to the retirement of the public debt of the United States. . . ."

BUY-AMERICAN EXEMPTIONS: H. R. 728 (Mr. Smith of Mississippi), introduced January 5. A bill to provide for the suspension by the President under certain circumstances of certain provisions of law embodying the buy-American principle to the Committee on Public Works.

COMMITTEE ON CONSUMER INTERESTS: H. Con. Res. 21 (Zablocki), introduced January 5. Concurrent resolution providing for the creation of a Joint Committee on Consumer Interests; to the Committee on Rules.

DUMPING BAN IN WATERS ADJACENT TO NEW YORK CITY: H. R. 3106 (Dorn of New York), introduced January 26. A bill to aid navigation and protect the fishing industry in the waters adjacent to New York City by prohibiting the dumping of certain materials in such waters; to the Committee on Public Works.

DUMPING BAN IN U. S. COASTAL WATERS: H. R. 3107 (Dorn of New York), introduced January 26. A bill to aid navigation and protect the fishing industry by prohibiting the dumping of certain materials in the coastal navigable waters of the United States; to the Committee on Public Works.

ELIMINATION OF SALMON TRAPS IN ALASKA: H. R. 242 (Bartlett), introduced January 5. A bill to provide for the gradual elimination of salmon traps in the waters of Alaska; to the Committee on Merchant Marine and Fisheries. The bill provides:

". . .Sec. 2. (a) The Secretary of the Interior shall compute the average catch per year for the period between January 1, 1952, and December 31, 1954, both dates inclusive, for each established trap (as defined in section 5) operated by a commercial operator (as defined in section 5).

"(b) The Secretary of the Interior shall close to salmon-trap fishing so many of the areas of sites of the traps operated by each commercial operator, and at such times, as the Secretary determines to be necessary so that the sum of the average catches (as computed under subsection (a)) of all established traps being operated at the close of each of the following years by such operator shall equal, as nearly as possible, but shall not be less than, the indicated percentage of the sum of the average catches (as so computed) of all established traps being operated by him on the date of enactment of this Act:

80 per centum at the close of 1956.

60 per centum at the close of 1957.

40 per centum at the close of 1958.

20 per centum at the close of 1959.

"(c) The Secretary of the Interior may prescribe such regulations as he considers appropriate to carry out this section. . . ."

FISH HATCHERY IN OKLAHOMA: H. R. 221 (Wickersham), introduced January 5. A bill to establish rearing ponds and a fish hatchery in western Oklahoma; to the Committee on Merchant Marine and Fisheries.

FISHERMEN'S ESTIMATED INCOME TAX: H. R. 322 (King of California), introduced January 5. A bill to extend to fishermen the same treatment accorded farmers in relation to estimated income tax; to the Committee on Ways and Means.

GREAT LAKES FISHERIES CONVENTION: The Senate received on January 26 the Convention on Great Lakes fisheries between the United States and Canada, signed at Washington on September 10, 1954; referred to Committtee on Foreign Relations. The Convention signed at Washington on April 22, 1946, was withdrawn on January 26, 1955.

HAWAII AND ALASKA STATEHOOD: S. 49 (Murray and 25 other Senators), introduced January 6. A bill to enable the people of Hawaii and Alaska each to form a constitution and State government and to be admitted into the Union on an equal footing with the original States; to the Committee on Interior and Insular Affairs.

HAWAII STATEHOOD: H. R. 49 (Farrington) introduced on January 5. A bill to enable the people of Hawaii to form a constitution and State government and to be admitted into the Union on an equal footing with the original States; to the Committee on Interior and Insular Affairs.

Also H. R. 187 (Saylor), H. R. 555 (Mack of Washington), introduced January 5; and H. R. 2531 (Farrington), H. R. 2535 (Engle), H. R. 2536 (Saylor) introduced January 20; All similar to H. R. 49.

IMPORT-EXPORT CONTROLS: H. R. 2401 (Gross), introduced January 17. A bill to amend the Export Control Act of 1949, so as to provide for import controls and modify the provisions relating to export controls for the protection of American agriculture, labor, and industry, and for other purposes; to the Committee on Banking and Currency.

INTERNATIONAL FOOD RESERVE: H. J. Res. 85 (Smith of Mississippi), introduced January 5. Joint resolution to provide for the creation of an international food reserve; to the Committee on Foreign Affairs.

Also H. J. Res. 128 (Polk) introduced January 13, similar to H. J. Res. 85.

MINIMUM WAGE INCREASE: S. 18 (Potter), introduced on January 6. A bill to amend the Fair Labor Standards Act of 1938 so as to establish a minimum wage of $1 an hour; to the Committee on Labor and Public Works.

Similar to S. 18 but minimum wage provisions vary from 90¢ to $1.35 an hour: introduced January 6, S. 57 (Smith of New Jersey); introduced January 5: H. R. 6 (Romey), H. R. 56 (Addonizio), H. R. 64 (Bailey), H. R. 135 (Machrowicz), H. R. 157 (Nelson), H. R. 215 (Wier), H. R. 277 (Hale), H. R. 455 (Lane), H. R. 537 (Mrs. Kelly of New York), H. R. 539 (Kelly of Pennsylvania), H. R. 560 (Multer), H. R. 576 (Rodino), H. R. 623 (Buckley), H. R. 658 (Dullinger), and H. R. 662 (Fine); introduced January 25, H. R. 2969 (Chudoff); introduced January 26, H. R. 3143 (Udall); introduced January 27: H. R. 3237 (Thompson of New Jersey), H. R. 3251 (Green of Penn.); introduced January 31: H. R. 3294 (Barrett), H. R. 3298 (Byrne of Penn.).

Some of these bills merely provide a higher minimum hourly wage. The others, in addition have many other provisions, including the exemption of ". . .any employee employed in catching, taking, harvesting, or farming of any kind of fish, shellfish, crustacea, sponges, seaweeds, or other aquatic forms of animal and vegetable life, including the going to and returning from work and loading and unloading when performed by any such employee. . . ."

NATIONAL FOOD RESERVE: H. R. 2409 (Johnson of Wisconsin), introduced January 17. A bill to provide for

stockpiling an adequate national safety reserve of food and fiber; to the Committee on Agriculture.

PRODUCERS INJURED BY INCREASED IMPORTS: H. R. 2992 (Reuss), introduced January 25. A bill to provide a means whereby domestic producers who are injured by increased imports resulting from trade agreement concessions may obtain preferences in bidding for Government contracts; to the Committee on Ways and Means.

SHRIMP IMPORT DUTY: H. R. 205 (Thompson of Louisiana), introduced January 5. A bill to provide for a 35-percent ad-valorem duty on the importation of shrimp; to the Committee on Ways and Means. Includes shrimp, shrimp tails, and shrimp meat, fresh or frozen (whether or not packed in ice), or prepared, canned, or preserved in any manner.

Also H. R. 265 (Colmer), introduced January 5, and H. R. 2449 (Willis), introduced January 17, similar to H. R. 265.

STANDARDS FOR IMPORTED FOODS: H. R. 252 (Byrnes of Wisconsin), introduced January 5. A bill to provide for standards to be prescribed by the Secretary of Agriculture governing imported agricultural food products; to the Committee on Agriculture. The bill provides in part:

". . .That, whenever applicable laws of the United States or duly authorized regulations thereunder prescribe standards or requirements for the labeling, packaging, quality, sanitation, or standards of identity, in respect to the production, manufacture, processing, packaging, distribution, or handling of any product of plant or animal life used or intended to be used as food for human or animal consumption in the United States, the Secretary of Agriculture shall prescribe like standards and requirements for similar products imported into the United States from foreign countries. . . ."

Also H. R. 2541 (August H. Andresen), introduced January 20, similar to H. R. 252.

TARIFF RATES: H. R. 2975 (Hand), introduced January 25. A bill to require approval by Congress of executive agreements with respect to the reduction of tariff rates before the same become effective; to the Committee on Ways and Means.

TARIFF ADJUSTMENTS: H. R. 864 (Van Zandt), introduced January 5. A bill to amend the Tariff Act of 1930 so as to provide a permanent procedure for adjustment of tariff rates on a selective basis, to regulate the flow of imported articles on a basis of fair competition with domestic articles, and for other purposes; to the Committee on Ways and Means.

Also H. R. 2807 (Bailey), introduced January 24, similar to H. R. 864.

TRADE AGREEMENTS EXTENSION: H. R. 1 (Cooper), introduced on January 5. A bill to extend the authority of the President to enter into trade agreements under section 350 of the Tariff Act of 1930, as amended, and for other purposes; to the Committee on Ways and Means.

Also H. R. 536 (Kean), introduced January 5, similar to H. R. 1.

TUNA IMPORT DUTIES: H. R. 674 (King of California), introduced January 5. A bill to amend the Tariff Act of 1930, so as to impose a 45-percent ad-valoren duty upon the importation of tunafish prepared or preserved in any manner, whether or not packed in oil or in oil and other substances when packed in containers weighing with their contents not more than fifteen pounds each, anf for other purposes; to the Committee on Ways and Means.

WATER POLLUTION CONTROL ACT EXTENSION: H. R. 1833 (Radwan), introduced January 10. A bill to amend the Water Pollution Control Act, so as to confer authority upon the Surgeon General to assist in the elimination, control, and abatement of pollution in certain international waters; to the Committee on Public Works.

WATER POLLUTION CONTROL ACT EXTENSION: H. R. 414 (Dondero), introduced January 5. A bill to extend the duration of the Water Pollution Control Act to June 30, 1958; to the Committee on Public Works.

WEATHER STATION IN GULF OF MEXICO: H. R. 198 (Thompson of Louisiana), introduced January 5. A bill to provide that one floating ocean station shall be maintained at all times in the Gulf of Mexico to provide storm warnings for States bordering on the Gulf of Mexico; to the Committee on Merchant Marine and Fisheries.

Also H. R. 3204, introduced January 27, similar to H. R. 198.

WILDLIFE-RESTORATION PROJECTS: H. R. 162 (Price), introduced January 5. A bill to provide that the United States shall aid the States in wildlife-restoration projects, and for other purposes; to the Committee on Merchant Marine and Fisheries.

Also H. R. 598 (Young), introduced January 5, and S. 756 (Bible), introduced January 27, all similar to H. R. 162.

Editorial Assistant--Ruth V. Keefe Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, and Helen Joswick

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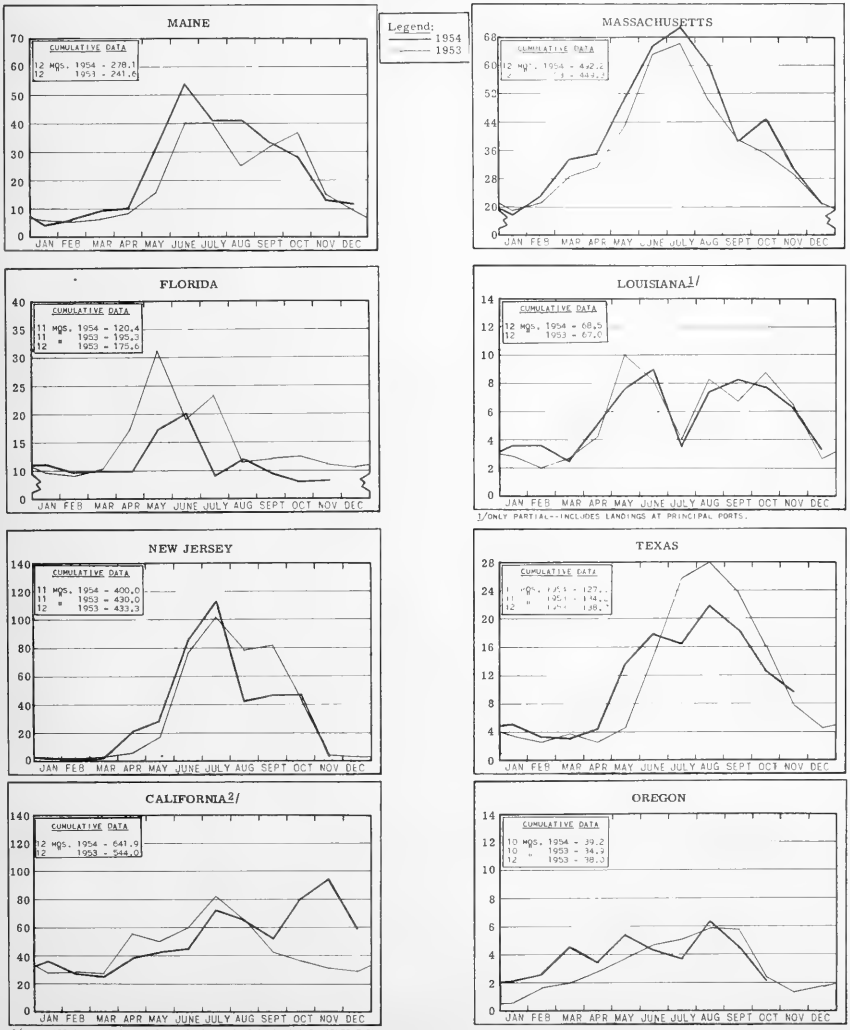
CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

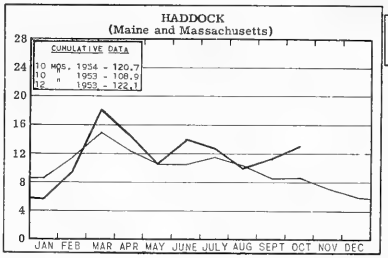


1/ONLY PARTIAL--INCLUDES LANDINGS AT PRINCIPAL PORTS.

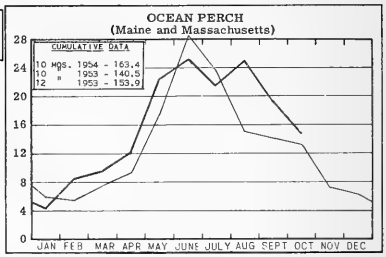
2/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

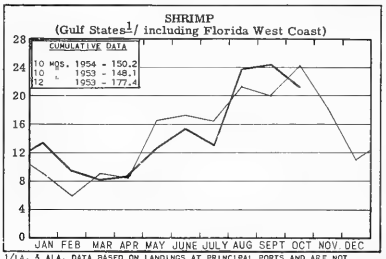
In Millions of Pounds



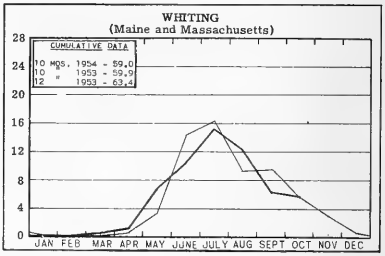
Legend:
1954
1953



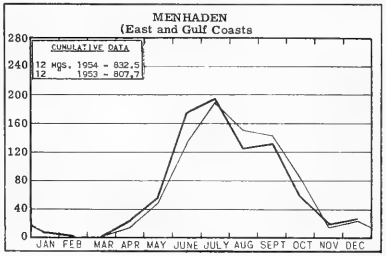
In Millions of Pounds

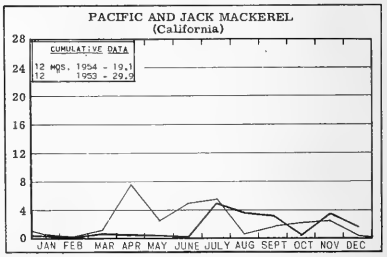


1/LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

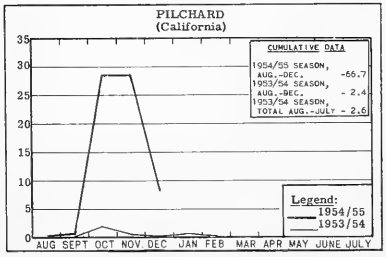


In Thousands of Tons





In Thousands of Tons



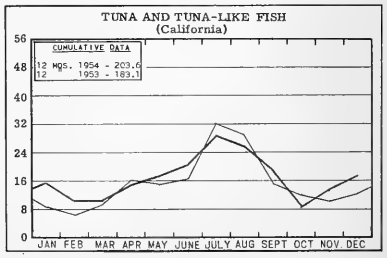
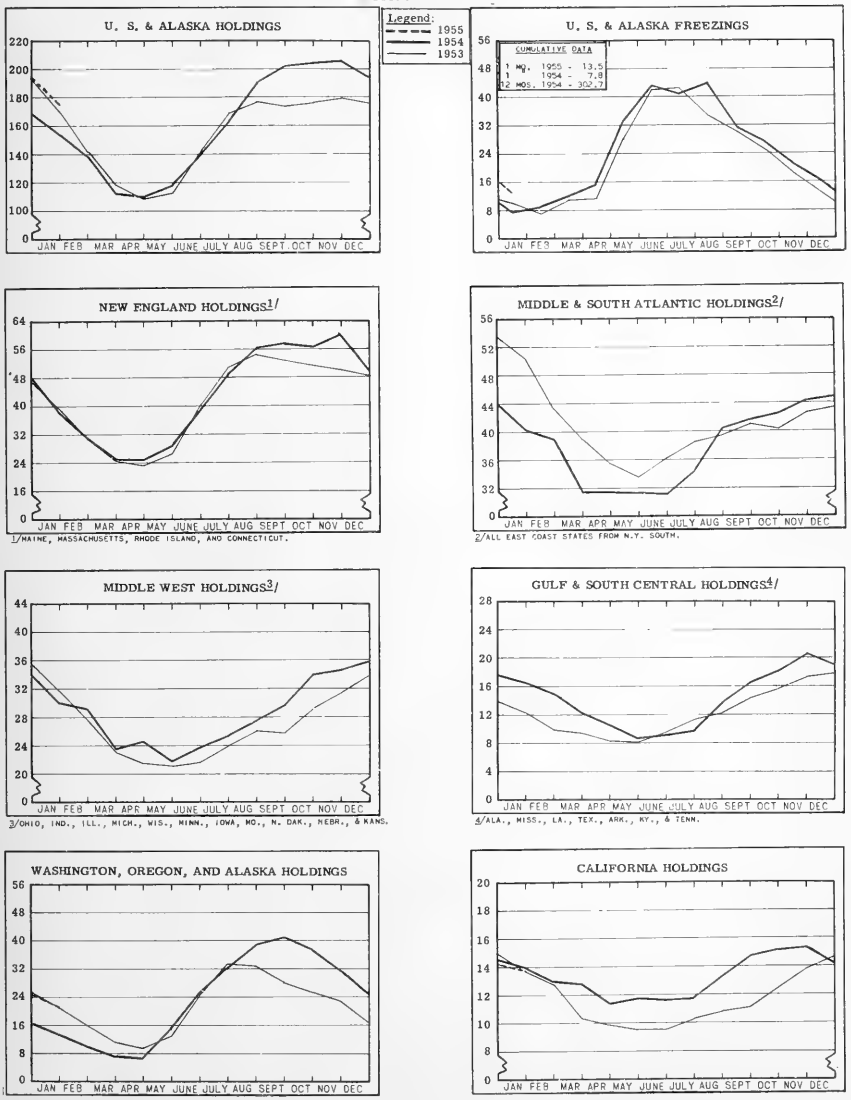


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

In Millions of Pounds



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., KY., & TENN.

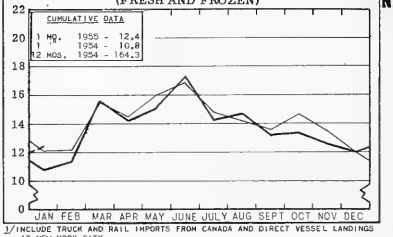
*Excludes salted, cured, and smoked products.

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

In Millions of Pound

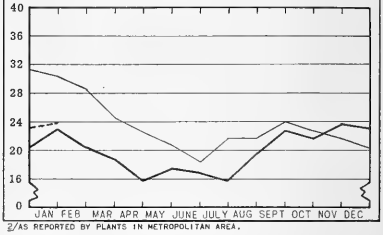
NEW YORK CITY

RECEIPTS[1]/ AT WHOLESALE SALT-WATER MARKET (FRESH AND FROZEN)



1/INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

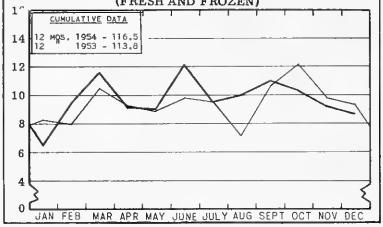
COLD-STORAGE HOLDINGS[2]/



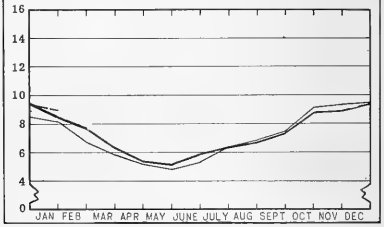
2/AS REPORTED BY PLANTS IN METROPOLITAN AREA.

CHICAGO

RECEIPTS AT WHOLESALE MARKET (FRESH AND FROZEN)

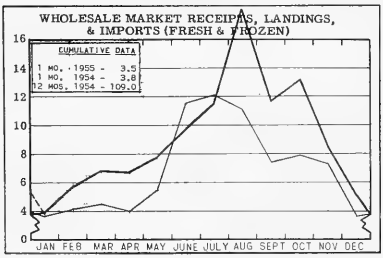


COLD-STORAGE HOLDINGS



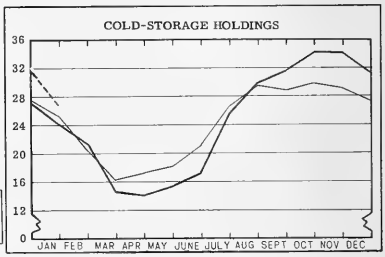
SEATTLE

WHOLESALE MARKET RECEIPTS, LANDINGS, & IMPORTS (FRESH & FROZEN)



BOSTON

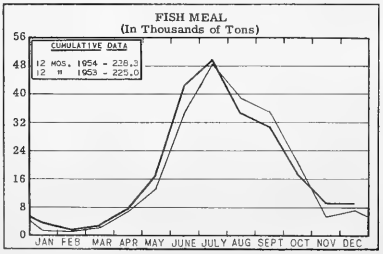
COLD-STORAGE HOLDINGS



Legend:
1955
1954
1953

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

FISH MEAL
(In Thousands of Tons)



FISH OIL
(In Millions of Gallons)

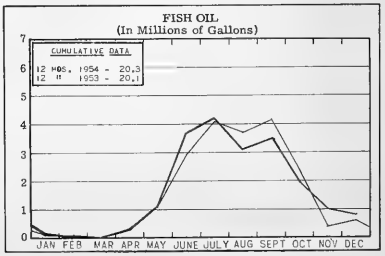
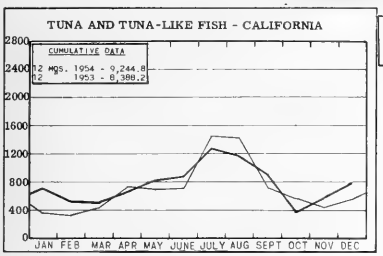
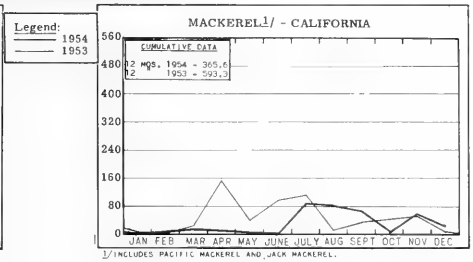


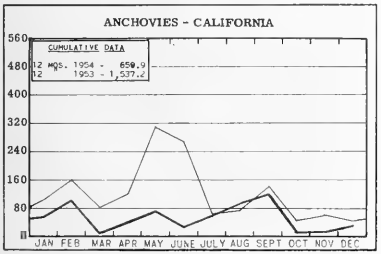
CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

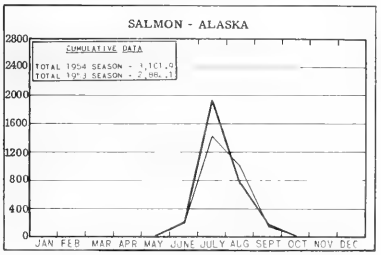
In Thousands of Standard Cases

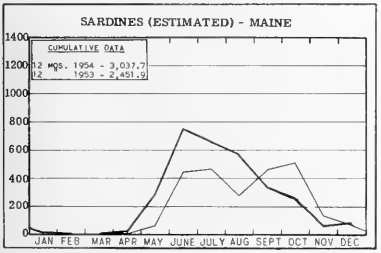




1/INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.

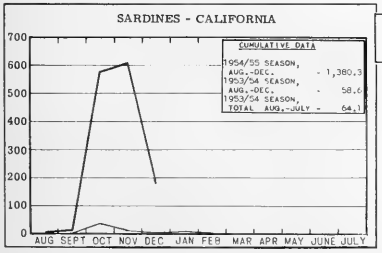






STANDARD CASES

Variety	No. Cans	Can Designation	Net Wgt.
SARDINES	100	¼ drawn	3¼ oz.
SHRIMP.....	48	--	5 oz.
TUNA	48	No. ½ tuna	6 & 7 oz.
PILCHARDS	48	No. 1 oval	15 oz.
SALMON	48	1-pound tall	16 oz.
ANCHOVIES	48	½ lb.	8 oz.



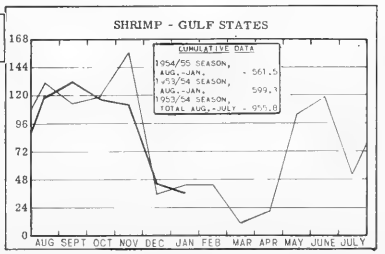
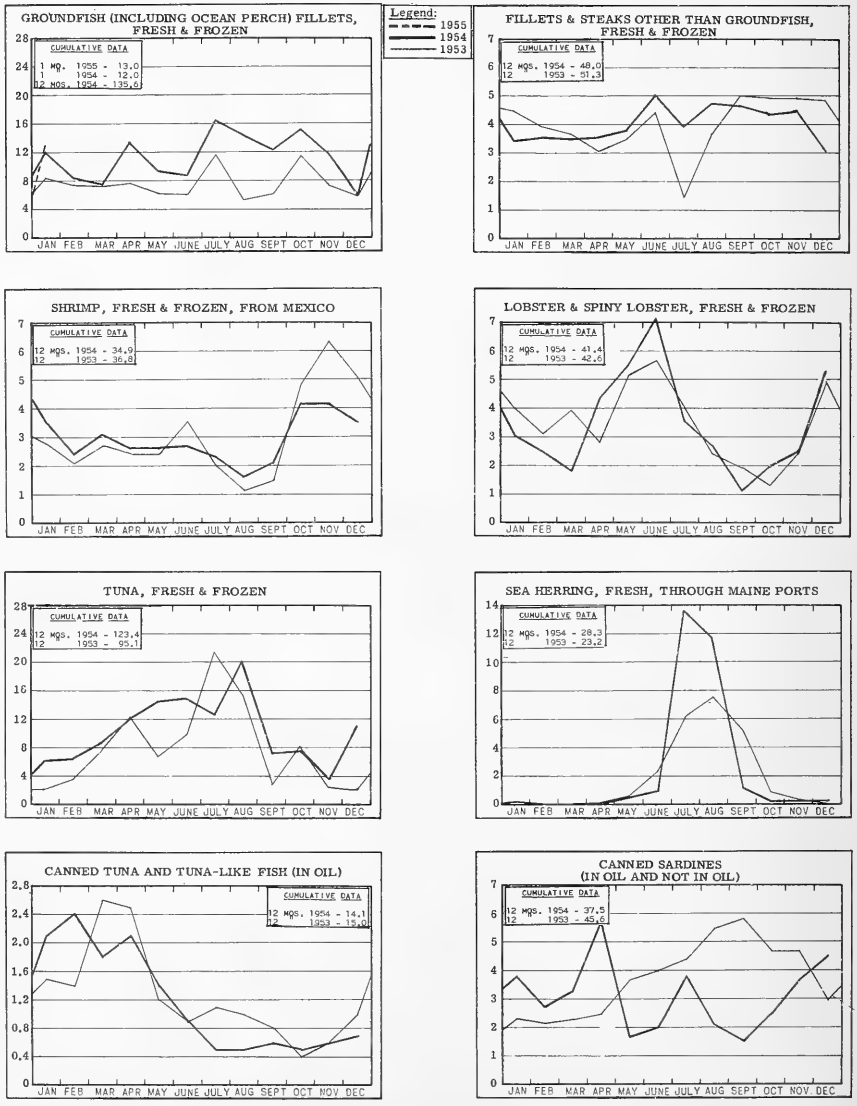


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



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.
FL - FISHERY LEAFLETS.
SSR.- FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number Title

CFS-1059 - Texas Landings, October 1954, 3 pp.
CFS-1065 - Frozen Fish Report, October 1954, 8 pp.
CFS-1066 - Massachusetts Landings, September 1954, 8 pp.
CFS-1071 - New Jersey Landings, September 1954, 2 pp.
CFS-1072 - Rhode Island Landings, Jan.-Mar. 1954, 6 pp.
CFS-1073 - Rhode Island Landings, April-May 1954, 7 pp.
FL - 147 - List of Federal Fish-Cultural Stations (revised November 1954), 5 pp., processed.
Sep. No. 389 - Outlines of a Long-Range Frozen Fish Program for the Armed Forces.
Sep. No. 390 - Japanese Fish-Netting Industry.
Sep. No. 391 - Some Factors Affecting the Color of Fish Sticks. Preparation of a Smoked Salmon Caviar Spread.

SSR-Fish. No. 112 - Tuna Longline Fishery and Fishing Grounds, by Hiroshi Nakamura, 184 pp., illus., processed, January 1954. The author has gathered together data from past surveys of the Japanese tuna fishery covering about 20 years, and on the basis of these data has attempted to clarify the character of the tuna long-lining grounds of the eastern Indian Ocean and the western Pacific. Included are descriptions of the types of fisheries, characteristics of the tuna long-line fishery, general outline of fishing grounds and fishing seasons, fishes taken by tuna long-line fishery, fishing grounds, and the distribution of the tunas and spearfishes as shown by their catch rates.

SSR-Fish. No. 131 - Mid-Pacific Oceanography: Part II-Transequatorial Waters, June-August 1950, January-March 1951, by Townsend Cromwell; Part III-Transequatorial Waters, August-October 1951, by Thomas S. Austin; 231 pp., illus., processed, June 1954.

SSR-Fish. No. 134 - Reaction of Tuna to Stimuli, 1953, by Albert L. Tester, Heeny Yuen, and Michio Takata, 37 pp., illus., processed, July 1954. This report includes the results of studies of the response of tuna (mostly "little tunny," Euthynnus affinis) to stimuli in tanks and ponds. It was found that the tuna in the pond responded positively and often violently to extracts of tuna and other fish flesh, viscera, etc. Sea tests were also conducted to observe the response of "wild" tuna not only to extracts, but also to visual stimuli such as lures of various sizes, shapes, and colors, used either alone or in conjunction with extracts. Although the work was conducted mostly from June to October 1953, sea tests extending from January 29 to November 13, 1953, are included. The main object of the studies was to study the response of tuna to chemical and visual stimuli in the hope that the information gained could be utilized in developing a substitute for live bait. The authors point out that: "In view of the lack of success in attracting local skipjack schools to the stern of a vessel and holding them there with the many materials and combinations of materials which have been used, we may ask what quality of attraction is missing. The missing quality is probably motion--the rapid motion of a living fish or squid, or the rapid motion of a lure trolled through the water. It may be that motion is a prerequisite to attraction by artificial lures. Other qualities of likely importance are size, shape, appearance, texture, and taste of the lures." An investigation of methods of imparting motion to small objects is presently under way. If a promising motile lure can be devised, it will be tested on schools of skipjack at sea.

SSR-Fish. No. 135 - Mid-Pacific Oceanography. Part IV, Transequatorial Waters, January-March 1952, by E. D. Stroup, 54 pp., illus., processed August 1954.

SSR-Fish. No. 138 - Virus Disease of Sockeye Salmon, Interim Report, by Stanley W. Watson, Raymond W. Guenther, and Robert R. Rucker, 36 pp., illus., processed, December 1954.

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

Description of Eggs and Larvae of Jack Mackerel (Trachurus symmetricus) and Distribution and Abundance of Larvae in 1950 and 1951, Fishery Bulletin 97 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 56), 40 pp., illus., printed, 30 cents, 1954.

Feeding Mechanism of the Sea Lamprey and Its Effect on Host Fishes, by Robert E. Lennon, Fishery Bulletin 98 (From Fishery Bulletin of

the Fish and Wildlife Service, vol. 56), 48 pp., illus., printed, 40 cents, 1954.

Intertidal Spawning of Pink Salmon, by Mitchell G. Hanavan and Bernard Einar Skud, Fishery Bulletin 95 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 56), 18 pp., illus., printed, 15 cents, 1954.

Method of Estimating Fish Populations, with Application to Pacific Sardine, by T. M. Widrig, Fishery Bulletin 94 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 56), 29 pp., illus., printed, 30 cents, 1954.

Noxious Marine Animals of the Central and Western Pacific Ocean, by Charles J. Fish and Mary C. Cobb, Research Report 36, 48 pp., illus., printed, 1954, 35 cents. This report is concerned with one of several oceanic-biology subjects designated by the Navy for investigation after World War II. The objective has been to assemble, analyze, and where possible correlate with environmental factors, available information on noxious marine animals of the central and western Pacific Ocean.

A Visit to a Federal Fish Hatchery, Circular 28, 8 pp., illus., printed, 10 cents, 1954. Describes and illustrates the many steps in the raising of different species of fish in the Fish and Wildlife Service hatcheries. Each hatchery propagates the kind of fish needed to support fishing in the waters stocked by the hatchery--waters in national parks and forests, wildlife refuges, and other fishing areas, and in farm fish ponds.

Whitings on the Coasts of the American Continents, by Isaac Ginsburg, Fishery Bulletin 96 (From Fishery Bulletin of the Fish and Wildlife Service, vol. 56), 25 pp., illus., printed, 20 cents, 1954.

MISCELLANEOUS PUBLICATIONS

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

Availability and Display of Frozen Foods in Retail Stores in Washington, D. C., Marketing Research Report No. 73, 30 pp., processed, August 1954. U. S. Department of Agriculture, Agriculture Marketing Service, Washington, D. C. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Reports on the results of a survey of 153 different frozen food items, including 21 fishery products.

"Bathypelagic Nemerteans of the Pacific Ocean," by Wesley R. Coe, illus., printed, 75 cents. (Reprinted from Bulletin of the Scripps Institution of Oceanography of the University of California, vol. 6, no. 7, pp. 225-286, plates 8-9, 32 figures in text.) University of California Press, Berkeley 4, California, 1954.

"Bottom Trawl for Herring Fishing," by V. G. Maksheev and V. K. Savrosov (Murmansk Experimental Base), article, World Fishing, August 1954, vol. 3, no. 8, pp. 290-293, illus., printed. John Trundell (Publishers) Ltd., Temple Chambers, Temple Avenue, London, E.C.4., England. This article (translated from an official Russian fishery publication) describes results of Russian experimental trawling for herring carried out in the North Sea during the summer of 1952 by the large Diesel trawlers Novorossiisk and Stalingrad. The special trawl nets were developed collectively by personnel of the Northern Ichthyological Institute Fish Catching Laboratory and the Murmansk Experimental Base, with the participation of the Manager of the Technical Fish Catching Laboratory of the Baltic Section of the All-Union Ichthyological Institute. The herring trawls are described in detail and are shown in several detailed drawings. The primary difference from the cod trawl is in the smaller meshes of the net and in the addition of one or two wooden kites attached with lines to the head rope to increase the vertical opening. For larger trawlers 115- and 150-foot trawls were constructed, and for medium trawlers 88-foot trawls were used. The 150-foot trawl proved to be the best size for the larger vessels. Size of mesh ranged from 22 mm. (.87 inch) in the cod end to 70 mm. ($2\frac{3}{4}$ inches) in the wings. The number of floats on the herring trawl (15 on each wing) is almost 3 times less than on the cod trawl because herring fishing is done at $3\frac{1}{2}$-4 knots and a larger number of floats would decrease the vertical opening by increasing resistance of the trawl in the water. By using two headrope kites, it was possible to obtain a vertical trawl opening of about 13-17 feet. Shooting and hauling differs from cod trawling only in the additional handling of the kites. The trawler Novorossiisk was at sea 84 days, fished for 40 days and caught 205,000 pounds of herring and 3,800 pounds of cod, mackerel, and horse mackerel. A total of 405 tows were made, with the daily catch varying from 5,000-17,500 pounds of herring. After the crew became familiar with the gear, catches rose sharply. The authors feel that these tests prove the practicability of trawling for herring, and they recommend the continued exploration of new herring grounds with this type of gear.

--D. E. Powell

(Canada) Fisheries Statistics of Canada, 1953, (New Brunswick), 10 pp., printed, French and English, 25 Canadian cents. Dominion Bureau of Statistics, Ottawa, Canada, 1954. Consists of tables giving the production and landed and marketed values of the principal species of fish and shellfish landed in New Brunswick in 1951-53; quantity and value of manufactured fishery products for 1952-53; vessels used in the sea fisheries; capital equipment in the primary fisheries operations; and the number of persons engaged in the fisheries.

(Canada) Fisheries Statistics of Canada (Nova Scotia), 1953, 10 pp., printed, French and English, 25 Canadian cents. Dominion Bureau of Statistics, Ottawa, Canada, 1954. Consists of tables giving

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the production and landed and marketed values of the principal species of fish and shellfish landed in Nova Scotia 1951 to 1953; quantity and value of manufactured fishery products for 1952 and 1953; proportion of sea fish taken offshore; vessels used in the sea fisheries; capital equipment in primary operations; and the number of persons engaged in the primary operations.

(Canada) Fisheries Statistics of Canada, 1953, (Ontario, Prairie Provinces and Northwest Territories), 10 pp., printed, French and English, 25 Canadian cents. Dominion Bureau of Statistics, Ottawa, Canada, 1954. Consists of tables giving the production and landed and marketed values of the principal species of inland fish landed in Ontario in 1951-53; capital equipment in the primary fisheries operations; and the number of persons engaged in the fisheries. Similar data are also given for the Prairie Provinces (Manitoba, Saskatchewan, and Alberta) and the Northwest Territories.

The Character and Significance of Sound Production Among Fishes of the Western North Atlantic, by Marie Poland Fish, Bulletin of the Bingham Oceanographic Collection, Peabody Museum of Natural History, Yale University, vol.XIV, article 3, 109 pp., printed, $1.65, the Bingham Oceanographic Laboratory, New Haven, Conn., April 1954. Purposeful sound production in fish may be accomplished either by air bladder mechanisms or stridulatory mechanisms, and often by combinations of both. In all cases frequency characteristics are a key to the origin of the sound. Since most sonic fishes remain silent except when they respond to definite external or internal stimuli, individual experimentation is necessary to evaluate soundmaking habits. Accordingly 60 North Atlantic coastal fishes were segregated and, where possible, were subjected to a series of carefully controlled situations and stimulations. Of these, 27 species produced sounds of biological origin, 27 sounds of mechanical origin, and 6 no sounds at all. Each species which demonstrated biological sound ability has been considered separately; characteristic outputs and spectrum analysis figures are described, the stimulation required for sound production is discussed, anatomical data on the mechanisms involved are given, and the significance of the species as a soundmaker is estimated. Experimental results indicate that sound may be used voluntarily as a means of communication, particularly to implement breeding, as an expression of fright, as a measure of defense or offense, as a response to environmental changes, or as a means of orientation; and sometimes there is no apparent reason for the sound. Involuntary sound production occurs under certain other stimulation. Included also are known data concerning geographical, seasonal, vertical, and diurnal distribution as well as breeding habits, since these facts are essential in predicting the sounds produced by any species.

"Extra Bag of Meal from Ton of Herring," by Arne B. Holt, article, Norwegian American Commerce, vol. 17, no. 12, pp. 18-22, illus., printed, December 1954. The Norwegian American Chamber of Commerce, Inc., 290 Madison Ave., New York 17, N. Y. Discusses the Norwegian herring industry's methods for recovery of stickwater from the fish meal and oil reduction process; the use of stickwater in poultry feeding experiments; and the storage and handling problems encountered for this bulky low-priced product. The new Norwegian method of processing "whole" fish meal, which includes the stickwater, is also reported upon. A report is included on experiments with the recovery of stickwater in the whale reduction industry.

The Farmer and the Fisherman, by Francis Joseph Weiss, article The American Farm Youth, vol. 20, no. 7, December 1954, pp. 14-17, printed, single copy 25 cents. American Farm Youth Publishing Co., Fairchild at Robinson, Danville, Illinois. Describes the relationship between farming and fishing. The author recommends intensified exploitation of the seas' resources to return to the land the mineral matters and other essentials contained below the surface of the earth's waters.

Fish Conservation Fundamentals, by R. W. Eschmeyer, 30 pp., illus., printed, single copies 25 cents, 10 or more copies 20 cents each (reprinted from Sport Fishing Institute Bulletin for January 1955 No. 38) Sport Fishing Institute, Bond Bldg., Washington 5, D. C., November 1954. This bulletin covers some of the major points in the evolution of fish conservation, eliminating the many qualifying statements which should normally be made if space permitted. The author points out "This shouldn't be regarded as 'the last word' on fish conservation, a field which is undergoing rapid change. It represents the observations of one professional fish conservationist, as of now." Broken down into 12 chapters, the bulletin covers the following: the general picture, stock, regulations, habitat improvement, population manipulation, creating more fishing waters, using the tools, commercial fishing, research, education, the value of angling, the modern program, the sportsman's role, and a reminder.

(FOA) Monthly Operations Report (Data as of July 31, 1954), 116 pp., illus., processed. Division of Statistics and Reports, Foreign Operations Administration, Washington 25, D. C. In addition to the usual tables and data, describes the Mutual Security Program for Fiscal Year 1955.

"The Hungry Anglerfish," by Bernard L. Gordon, article, Nature Magazine, vol. 47, no. 9, November 1954, pp. 469-470, illus., printed, single copy 50 cents. American Nature Association, 1214 16th St., NW., Washington 6, D. C.

(Norway) Statistisk Arbok for Norge, 1954 (Statistical Yearbook of Norway 1954), 385 pp., printed, in Norwegian with preface and table of contents in English. Central Bureau of Statistics of Norway, Oslo, Norway, 1954. Consists of tables on a wide range of subjects, including health and economics in Norway as well as a series of tables on the fisheries, sealing, and whaling.

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Pacific Marine Fisheries Commission Bulletin 3, 130 pp., illus., printed. Pacific Marine Fisheries Commission, 1400 S. W. Fifth Ave., Portland 1, Oregon, 1954. Contains the following papers on the Pacific Coast sablefish fisheries: "The Sablefish Fishery of California: I. History and Research," by J. B. Phillips; "II Catch Analysis," by J. B. Phillips and Seigi Imamura; "The Washington and Oregon Sablefish Fishery," by F. Heward Bell and Alonzo T. Pruter; "The Sablefish Fishery of British Columbia," by K. S. Ketchen and C. R. Forrester; "Preliminary Report on the Alaska Sablefish Fishery," by Quentin A. Edson; "A Racial Study of Pacific Coast Sablefish, Anoplopoma fimbria, Based on Meristic Counts," by J. B. Phillips, C. R. Clothier, and D. H. Fry, Jr.; "Results of Sablefish Tagging Experiments in Washington, Oregon, and California," by Edwin K. Holmberg and Walter G. Jones; "Age and Growth of the Oregon Sablefish Anoplopoma fimbria," by Alonzo T. Pruter; and Appendix "Pacific Coast Sablefish Catches by Region of Landing."

"Pacific Salmon for Atlantic Waters?" by W. E. Ricker, article, The Canadian Fish Culturist, Issue Sixteen, August 1954, pp. 6-14, printed. Department of Fisheries, Ottawa, Canada. A brief presentation of some of the well-known facts concerning the natural distribution of the Atlantic and Pacific salmons, earlier transplantations of Pacific salmon, difficulties of salmon transplantation and effects upon Atlantic fishes, increasing the supply of native Atlantic salmon, sport fishing, and the probable long-term effects of successful salmon introductions upon the general economy and standard of living of the eastern provinces of Canada.

Proceedings of the Gulf and Caribbean Fisheries Institute, Sixth Annual Session, Miami Beach, November 1953, 143 pp., illus., printed, $1. The Gulf and Caribbean Fisheries Institute, The Marine Laboratory, University of Miami, Coral Gables, Florida, September 1954. Contains all of the papers presented at the sixth annual session (Miami Beach, 1953) of the Institute. At the Industry Session the papers presented dealt with the handling of shrimp aboard fishing vessels and at the dock, in the packing and freezing plant, in the breading plant, and in the canning plant; and the organization of a quality-control program in a fishery plant. Papers for the Economic Session discussed the financing of fishing vessels: by commercial banks, in the Gulf States, through the ship-construction industry, and by financial institutions; and the financing of the Netherlands, Danish, and Swedish fishing fleets. Subjects of the papers presented at the Biological Session included: fisheries dynamics and the concept of maximum equilibrium catch; changing concepts in fishery research on the Great Lakes; half a century of fishery biology in Europe; and 50 years of progress in solving fishery problems. The Technical Session presented papers on the discovery of a new shrimp bank at Golfo de Batabano, Cuba; migrations of the common shrimp, Penaeus setiferus, along the South Atlantic and northern Gulf coasts of the United States; evaluation of five-pound packages of glazed and unglazed shrimp; comparison of objective tests for quality of fresh and frozen Gulf shrimp; the use of ultraviolet ("black") light for determining quality in iced shrimp; further experiments in holding of fresh shrimp in refrigerated sea water and ice; and freezing Gulf of Mexico shrimp at sea.

"Regional Bibliography for 1953," Contribution No. 127, printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 4, no. 2, pp. 160-181, June 1954.) The Marine Laboratory, University of Miami, Coral Gables, Fla. Includes papers, among others, on the following subjects: hydrography; physical properties; plankton; bottom fauna and flora; fish; marine fisheries; marine fishery investigations; marine mammals; shell-fisheries; and marine fouling and boring. The scope of the bibliography is limited in general to the area which includes the southeastern United States, the Gulf of Mexico, and the Caribbean, but papers of more general interest are listed in cases where they have some special significance to the area.

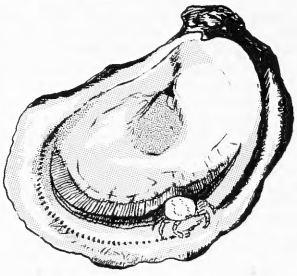
South Africa's Pilchard Industry in 1954, article, The South African Shipping News and Fishing Industry Review, vol. IX, no. 11, November 1954, pp. 55-113, illus., printed. S. A. Trade Newspapers (Pty.) Ltd., Ardis House, 16 Bree St., Cape Town, Union of South Africa. This is a detailed report of a comprehensive survey of the developments, status, and prospects of the Union of South Africa's pilchard industry. (Does not include the industry in South-West Africa.) The survey was conducted by the editor and his staff after an extended visit to the West Coast fishery. The report includes a summary of the history of the industry from a small beginning 10 short years earlier to an industry which is comprised of 200 fishing vessels harvesting 250,000 metric tons of fish a year; and 15 processing plants turning out £10 million (US$28 million) worth of canned fish, fish meal, and fish oil. The Director of the South African Fishing Industry Research Institute discusses the technical developments in the industry. An interview with the managing director of the Fisheries Development Corporation covers the biological research on the fish shoals. A detailed report on the make-up and operation of the individual canneries and reduction plants completes the picture of the status on the South African pilchard industry in 1954. (With the maasbanker, or jack mackerel, pack doubling the pilchard pack in the 1954 season, the title "South Africa's Pilchard Industry" reads a little untrue . . . , points out the author.)

CONTENTS, CONTINUED

INT.-DUP. SEC., WASH., D.C. 76133

OYSTER CRABS IN CHESAPEAKE BAY

When a visitor to Solomons, Maryland, some years ago shucked an oyster, he was astonished to find a pale, flesh-colored crab among the gills on the oyster. Shucking still further, he found that a number of oysters contained the strange creatures. Biologists at the Chesapeake Biological Laboratory and Bay oystermen were far from surprised. They know, for example, that the oyster is not the only creature living within the confines of its shell. The oyster crab, Pinnotheres ostreum, is frequent enough in Maryland oysters to warrant several inquiries a year at the laboratory.



Oyster crab (Pinnotheres ostreum) approximately natural size.

Strangely enough, very little is known about the life history of this small crab. One of the most frequent questions is, "How does the crab get into the oyster?" The answer to this question is fairly well known. When the oyster crab spawns, the larvae hatch from the eggs of the females within an oyster and pass out into the surrounding water. These minute young pass through several developmental stages common to all crabs. After hatching from the egg, the zoea, which is actually somewhat larger, than the blue crab zoea, is a free swimming animal and becomes part of the zooplankton of the water. It then develops into the megalops, or second larval stage. Finally it reaches the first crab stage, which invades the oyster along with food and water that is normally pumped into the mollusk.

In the Chesapeake the distribution of the oyster crab is apparently limited by salinity, the greater number being found in the saltier areas. Upper Bay bars are virtually free of them and they occur only infrequently north of the Patuxent River.

At one time the oyster crab was regarded as a commensal creature, i.e., one that did not harm or was not harmed by the animal with which it lived, but now it is regarded as a parasite of the oyster, on the basis of the gill and mantle damage to these mollusks. Oysters in Virginia are more often infested, 30-40 percent having these parasitic crustaceans. According to investigators in the lower Bay, the oysters containing crabs appeared to be in poorer condition than noninfested oysters, although there was no evidence of oyster mortalities traceable to the oyster crab.

Although the male oyster crab has eluded the biologist for many years, collections were definitely made in 1945. It is very tiny, roughly one-fifth the size of an adult female. The male is found living within the oyster, although considerably fewer males than females have been found. After entering the oyster, the growth and development of the oyster crab are characterized by degenerative changes; the eyes become smaller, the shell does not harden, and the limbs and claws remain soft and weak. The shell, whitish and translucent, is tinged with pink and orange.

The oyster crab is relatively inactive; the oyster apparently provides sufficient protection. It is believed to feed upon the food streams which become tangled in its legs or trapped on the gills of the oyster during the pumping activities of the latter.

These curious marine creatures commands a premium price as a delicacy for use in stews, but are not abundant enough for extensive commercial use. They are even eaten alive by humans, along with raw oysters on the half shell, and have a delicate, sweetish flavor, as can be attested by people who have eaten them.

--Maryland Tidewater News, November 1954