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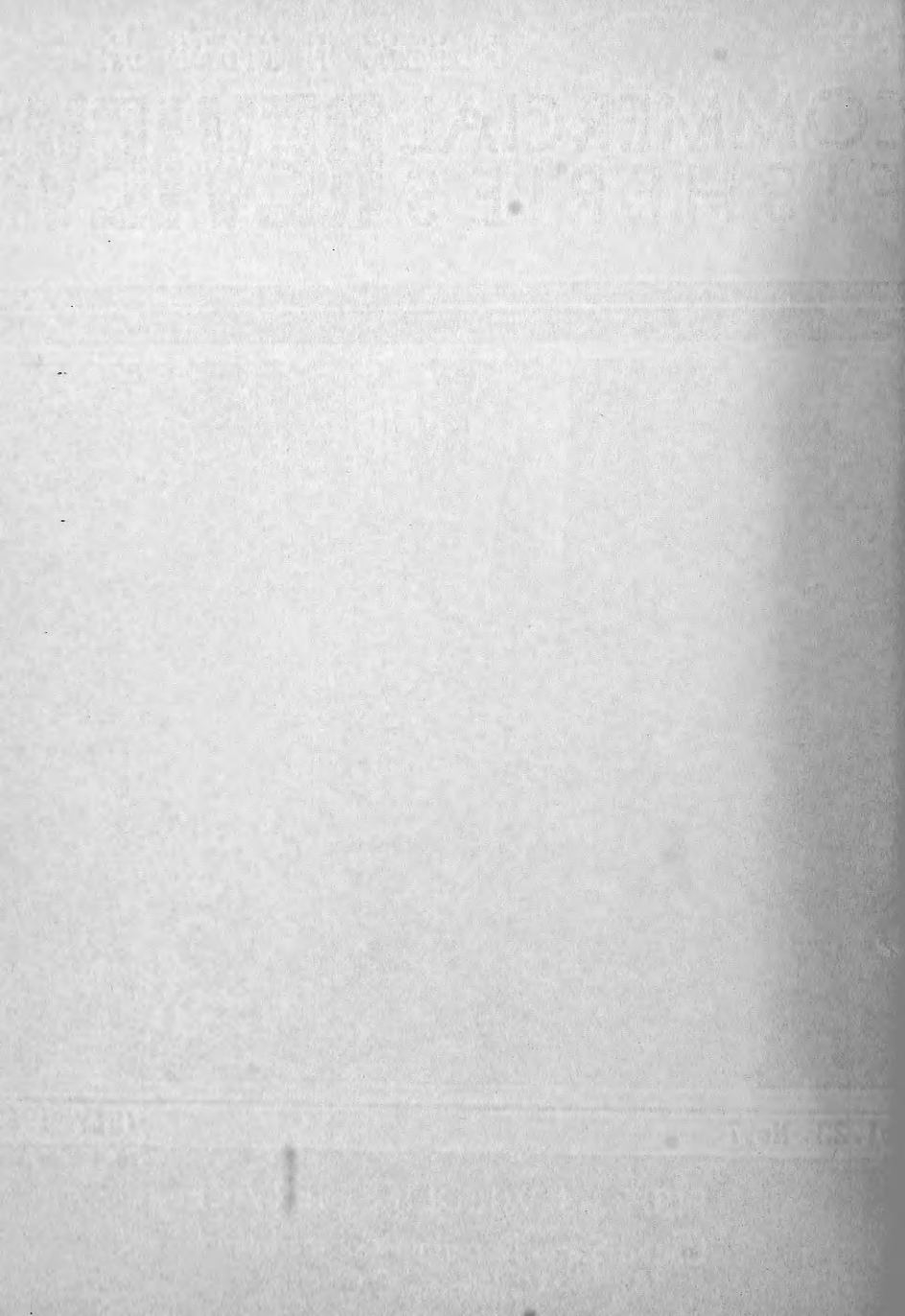
COMMERCIAL FISHERIES REVIEW



Vol. 22, No. 7

JULY 1960

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COMMERCIAL FISHERIES REVIEW



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

Joseph Pileggi, Editor

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Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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5/31/63

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PROXIMATE COMPOSITION OF SOUTHERN OYSTERS-- FACTORS AFFECTING VARIABILITY

Charles F. Lee,* Caroline H. Kurtzman,** and Leonard Pepper***

ABSTRACT

Fifty-one pairs of samples of raw shucked oysters were collected from producing plants in Georgia, South Carolina, and the Gulf Coast States in an extension of an earlier study of the proximate composition of oysters. From each plant, unwashed "shell" oysters and washed plant oysters as packed were obtained to compare the effect on composition of differences in plant practices. The dry solids, fat, and carbohydrate contents of all samples conformed to the usual seasonal pattern of variability. Low values observed in summer and fall months increased to a maximum in the late spring just prior to the long spawning period of the Southern oyster.

The ash and salt content of the "shell-oyster" samples are primarily factors of the salinity of the water in which the oysters are grown. In the test period, salinities were high during the late summer. Soluble chlorides, mostly salt, are lost during shucking and washing of the oysters so that the ash and salt content of plant-washed samples are influenced by the amount of exposure to fresh water.

Protein and fat content on a dry basis are increased in the washed oysters, since these components are less soluble and thus constitute a larger proportion of the solids remaining after the soluble salts are lost.

The data on composition emphasize the benefit that would be derived for both producer and consumer if the seasonal demand for oysters in the fall could be met with oysters harvested and frozen in the spring.

INTRODUCTION

The investigation of the proximate composition of Southern oysters conducted at the Fishery Technological Laboratory, College Park, Md., of the U. S. Bureau of Commercial Fisheries, was continued for a second year. The conclusions reached after the first year (Lee and Pepper 1956) regarding the pattern and extent of seasonal fluctuation have been generally confirmed, so this work is now complete.

The term "Southern" is used here to distinguish the product of the Gulf of Mexico and of the South Atlantic coastal areas. Louisiana has the largest production of fresh shucked oysters, with lesser quantities from Mississippi, Alabama, Western Florida, South Carolina, and Georgia. Southern oysters, *Crassostrea virginica*, are of the same species as oysters of Chesapeake and Delaware Bays, but the shucked product is handled differently in the South.

The investigation of the composition of Southern oysters had several objectives: (1) Little published information is available on the composition of oysters from that area. Such information is needed by dietitians, processors, and others. (2) The data on unwashed and plant-washed samples provide a means of comparing the effect on composition of different methods of processing. These data are important with re-

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spect to application of the Food and Drug Administration's Standards of Identity to raw shucked oysters. (3) Data on oysters from a number of different states and growing areas are needed to broaden the applicability of results of studies on freezing and utilization of oysters by research groups in Florida and Louisiana.

ORIGIN OF SAMPLES

The oyster samples were collected at producing plants: 25 sample pairs were obtained from Louisiana, 9 from Alabama, 7 from Florida, 5 from South Carolina, 3 from Georgia, and 2 from Mississippi. Samples of mixed origin were not taken, so each sample represented oysters grown in the state in which it was collected.

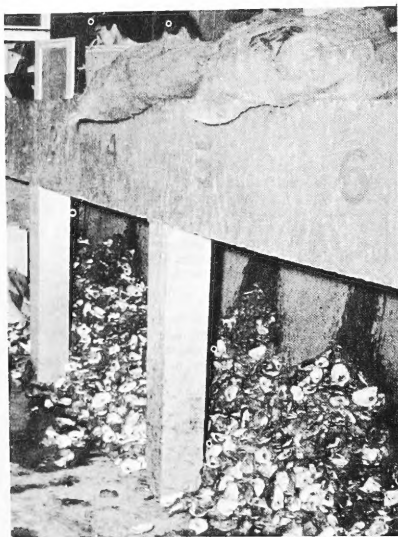


Fig. 1 - Oysters are brought to the shucking house in burlap bags in some Southern oyster plants.

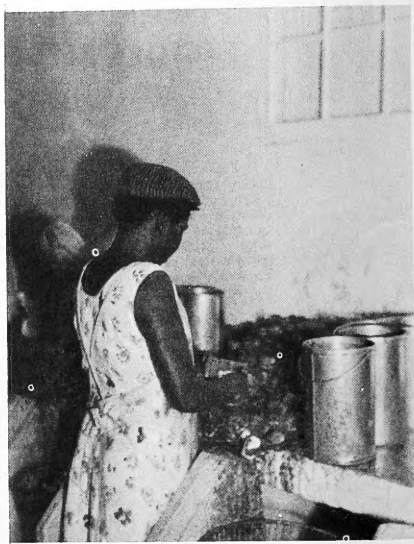


Fig. 2 - Three sizes are being sorted into the "pots" at the right.

Two samples were collected from each operating plant visited. One sample, called the "shell" sample, consisted of unwashed shucked oysters representative of the oyster as harvested. Variability in composition of these samples is influenced by environmental factors of temperature and salinity, sampling time with relation to spawning cycle, and other factors such as degree of parasitic infestation that affect the health or "condition" of the oyster. The composition of the shell sample is also affected by the way the shell oyster is handled between the time of harvest and sampling and by the way the sample is taken.

The second sample, called the plant sample, was a randomly-selected pint can of the regular plant product. Variability in the composition of these samples is affected not only by differences in the "shell" oyster but also by shucking, washing, and draining practices of the particular plant from which the sample is obtained.

EXPERIMENTAL METHODS AND RESULTS

A total of 51 "shell" and plant samples were obtained during the period from October 1955 to October 1956, inclusive. These were analyzed for moisture, crude

protein, crude fat, ash, and total chlorides as sodium chloride. The values reported for carbohydrates have been calculated by difference. Because the maximum observed dry-matter content was $2\frac{1}{2}$ times the minimum value (range 7.3 to 18.4 percent), the data are reported in the tables on a dry basis. This method of reporting facilitates comparisons of the effects of external factors on the composition of the oyster. The data are given in tables 1 and 2.

Table 1 - Composition of Shell and Plant Samples of Oysters According to State Origin

State	Number of Pairs ¹	On Moisture-Free Basis										Salt ²		Carbohydrates	
		Moisture		Protein		Fat		Ash		Shell	Plant	Shell	Plant		
		Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant					Shell	Plant
(Percent)															
Louisiana	25	87.8	88.8	52.0	54.0	10.8	11.2	12.4	8.5	6.4	3.4	25.0	26.3		
Mean		91.4	92.7	63.3	66.2	16.7	17.6	20.6	17.1	12.6	7.2	34.8	36.3		
Minimum		81.6	82.1	44.5	43.1	6.9	6.4	5.3	4.2	1.2	0.4	8.1	15.6		
Mississippi	2	87.5	86.8	48.7	50.7	13.0	14.1	11.8	7.7	5.6	2.2	26.5	27.5		
Mean		92.5	89.1	58.7	60.8	18.1	19.5	17.7	11.1	10.1	3.8	37.5	35.6		
Minimum		82.5	84.3	38.6	40.7	8.0	8.8	5.8	4.3	1.0	0.6	15.6	19.3		
Alabama	9	86.2	86.1	44.3	45.0	11.8	13.9	10.3	7.1	5.6	2.7	33.6	33.9		
Mean		88.5	90.0	55.5	55.9	14.0	18.7	14.1	12.1	9.9	6.2	45.8	40.3		
Minimum		84.4	82.5	35.4	39.6	7.4	9.4	5.7	3.6	1.3	0.4	21.4	23.6		
Florida	7	88.3	87.3	48.3	53.2	9.4	12.1	17.8	10.7	10.0	5.0	24.5	24.0		
Mean		91.1	88.7	52.6	56.8	11.2	16.5	26.7	16.9	19.8	9.9	35.7	33.1		
Minimum		86.0	85.5	45.7	48.1	6.7	8.3	8.0	5.8	2.9	2.2	18.4	19.0		
Georgia	3	90.0	85.8	43.8	50.7	10.2	9.9	24.8	13.2	19.6	6.6	21.2	26.3		
Mean		92.0	89.7	47.1	57.3	15.2	10.8	31.1	16.4	25.4	10.0	26.3	32.6		
Minimum		87.4	82.2	40.6	45.4	7.5	8.8	22.7	7.3	15.6	2.7	13.9	16.9		
South Carolina	5	86.1	84.2	47.7	54.1	7.7	9.3	20.8	11.9	14.4	6.7	23.8	24.7		
Mean		88.8	85.8	49.8	55.9	9.1	10.2	24.6	15.3	19.8	10.0	31.0	27.1		
Minimum		83.0	83.0	45.8	52.1	5.6	8.7	17.4	8.9	10.5	4.8	19.7	22.1		

¹/Each pair of samples consists of unwashed oysters ("shell") and washed oysters as packed (plant).

²/Total chlorides are reported as salt.

PREPARATION OF THE SAMPLE FOR ANALYSIS: The entire contents of the sample can, from 250 to 450 grams of oysters and body fluids, were ground in a laboratory blender. Any large pieces of shell were removed, but careful inspection was not needed, since most of the shell and grit settled out of the ground oysters.

MOISTURE: The method of the Association of Official Agricultural Chemists (AOAC) for total solids in raw oysters was used (8th edition, section 18.6) except that a Petri dish was substituted for the metal one. Metal dishes were found hard to clean. Glass dishes gave consistent tare weights.

Comparison of the average values for moisture content in tables 1 and 2 indicates that, in most instances, there is little difference between the values for plant and "shell" samples. The data in table 2 indicate an irregular correlation of moisture content of both plant and "shell" oysters to season of harvesting. Lower moisture values and correspondingly higher solids



Fig. 3 - Care is used to avoid cutting up the oysters as the muscle is freed from the shell.

contents were observed from March through June just prior to the spawning season, this being the period of most rapid growth. The dry solids content declined rapidly to a low point in August and did not show definite recovery until December after cooler waters had stopped oyster spawning and growth was resumed.

Table 2 - Composition of Shell and Plant Samples of Oysters According to Month Samples Were Collected

Month	Number of Pairs ^{1/}	On Moisture-Free Basis												
		Moisture		Protein		Fat		Ash		Salt ^{2/}		Carbohydrates		
		Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant	Shell	Plant	
(Percent)														
Oct. 1955	Mean	5	90.5	88.5	54.5	58.1	9.0	9.1	19.8	13.4	13.5	6.2	16.8	19.5
	Max.		92.5	92.7	60.2	66.2	16.7	10.3	26.7	17.1	19.8	9.9	21.3	23.9
	Min.		88.7	83.8	48.1	51.1	5.8	8.3	14.9	8.0	8.7	3.8	8.1	15.6
Nov. 1955	Mean	5	87.9	89.5	52.5	56.5	9.0	9.2	16.6	11.9	9.4	5.8	22.0	22.3
	Max.		89.8	92.3	58.4	60.5	11.2	11.2	24.3	16.9	14.1	9.9	29.0	24.5
	Min.		86.1	86.4	47.2	53.8	6.9	8.3	11.0	9.4	5.5	4.1	16.3	19.9
Dec. 1955	Mean	3	86.3	86.1	50.3	55.5	7.9	9.4	16.1	10.6	10.1	5.7	25.7	24.4
	Max.		89.8	91.7	54.9	61.5	8.7	9.6	19.6	12.1	10.5	6.2	31.1	29.2
	Min.		84.4	82.5	46.1	49.2	6.9	9.2	14.1	9.7	9.8	5.2	22.4	18.9
Jan. 1956	Mean	6	87.7	86.8	48.1	47.5	9.7	12.8	15.4	9.7	8.6	3.8	26.8	32.0
	Max.		91.3	91.5	50.4	54.8	12.7	17.9	21.3	9.2	12.6	5.5	31.8	36.9
	Min.		83.8	83.5	41.5	39.6	7.2	9.2	8.6	5.6	4.7	1.5	20.8	27.1
Feb. 1956	Mean	7	88.1	87.1	43.1	46.5	11.7	12.9	14.0	8.3	9.4	3.3	31.2	32.3
	Max.		92.0	89.9	46.1	52.2	16.8	18.7	22.7	16.4	17.8	7.0	35.7	35.7
	Min.		85.3	82.2	35.4	40.0	5.6	8.8	5.3	4.2	1.2	0.7	23.5	26.8
Mar. 1956	Mean	6	84.8	85.6	44.0	46.0	13.5	15.8	8.1	6.1	2.9	1.6	34.4	32.2
	Max.		87.7	88.9	51.4	54.6	18.1	19.5	11.9	10.5	5.4	3.6	45.8	40.3
	Min.		81.6	82.1	38.6	40.7	7.4	12.4	5.7	3.6	1.0	0.4	22.7	21.6
April 1956	Mean	5	86.5	85.6	46.6	48.3	12.5	14.8	11.7	6.9	6.1	2.3	29.2	29.9
	Max.		91.1	87.9	52.6	56.8	13.3	16.5	16.4	9.1	10.5	2.8	37.3	40.0
	Min.		82.5	83.7	42.2	39.8	10.8	13.1	6.4	4.7	1.9	1.0	20.5	22.3
May 1956	Mean	2	84.9	86.5	49.6	51.2	12.1	12.3	7.9	5.8	3.9	2.0	30.5	30.7
	Max.		86.5	89.9	52.0	52.5	13.5	13.5	8.1	5.9	3.9	2.2	34.5	30.7
	Min.		83.2	83.0	47.1	50.0	10.9	11.0	7.6	5.8	3.8	1.8	26.4	30.6
June 1956	Mean	2	83.8	86.1	47.5	50.2	10.3	12.0	11.7	6.6	6.2	3.0	30.6	31.2
	Max.		85.0	89.7	48.3	53.1	10.3	12.3	12.8	7.0	6.7	3.6	32.6	33.5
	Min.		82.7	82.5	46.6	47.3	10.2	11.7	10.6	6.2	5.6	2.4	28.6	29.0
July 1956	Mean	2	87.9	90.1	59.5	61.1	8.8	7.5	10.4	8.0	4.5	2.9	21.3	23.4
	Max.		88.6	91.5	63.3	61.8	9.8	8.6	10.9	9.3	4.8	3.6	24.5	25.1
	Min.		87.1	88.7	55.8	60.4	7.8	6.4	9.9	6.7	4.2	2.3	18.1	21.7
Aug. 1956	Mean	2	90.0	90.4	56.6	58.7	9.9	9.5	10.4	8.7	3.1	2.7	23.1	23.1
	Max.		90.6	91.2	57.3	59.4	10.8	10.7	11.9	9.9	5.0	4.2	26.2	23.8
	Min.		89.4	89.5	55.9	58.0	9.0	8.3	9.0	7.5	1.2	1.1	20.0	22.4
Sept. 1956	Mean	2	88.4	88.6	53.8	58.3	9.6	8.6	14.5	9.6	10.6	5.0	22.0	23.5
	Max.		88.6	90.2	54.8	58.9	11.6	9.5	18.3	9.8	11.2	5.8	26.8	24.0
	Min.		88.2	86.9	52.8	57.8	7.6	7.7	10.8	9.4	9.9	4.3	17.3	23.0
Oct. 1956	Mean	4	89.5	87.7	49.2	54.6	9.7	10.3	23.1	13.6	14.2	6.9	19.0	21.5
	Max.		90.7	91.9	53.0	57.3	10.8	10.9	31.1	15.9	25.4	10.0	25.7	25.9
	Min.		88.0	84.3	45.8	52.1	7.9	10.0	17.2	8.4	1.3	0.4	13.9	16.9

^{1/} Each pair of samples consists of unwashed oysters ("shell") and washed oysters as packed (plant).

^{2/} Total chlorides are reported as salt.

CRUDE PROTEIN: Total nitrogen was determined by the Kjeldahl method, mercury being used as the catalyst. The ammonia was collected in 20 milliliters of 4-percent boric acid and was titrated directly with 0.2 normal sulfuric acid.

Shucking and washing the oysters do not significantly affect protein content on a dry basis. Plant samples are higher in protein, but this finding can be accounted for by the fact that as the soluble salts present in the body fluids are lost during shucking and washing, the more insoluble constituents--that is, protein and fat--make up a greater proportion of the remaining solids. The protein content of oysters follows a fairly definite seasonal cycle opposite in phase from the glycogen content cycle; that is, protein content is high during July through September, when glycogen is low, and low in February and March, when glycogen is high. The explanation is that protein constitutes a much larger proportion of the solids remaining after glycogen is used during the spawning cycle.

CRUDE FAT: The method of the AOAC for crude fat in fish and shellfish by acid hydrolysis (8th edition, section 18.12) was used.

"Fat" oysters is a trade expression that refers to the plump, creamy condition associated with the seasonal build-up of glycogen. Oysters are usually classified as a nonfat seafood. Actually, on a dry basis, the solvent-soluble lipids constitute an average of 10.5 percent of "shell" oysters and 11.7 percent of the washed oysters. Some oysters contain 18 to 20 percent fat on a dry basis. Experiments have shown that in frozen storage, oysters develop a rancid flavor instead of the usual sour flavor that develops in spoiled raw iced oysters (Schwartz and Watts 1957; Fieger, Novak, and Bailey 1959). It is interesting to note that the fat content follows the same type of seasonal cycle as do dry solids and glycogen contents; that is, the fat content varies from a high of 13 percent in March and April to a low of 8.8 percent in July. The fluctuations are less extreme--with the fat content remaining fairly constant, between 9 and 10 percent--from August through December.

ASH: Fifteen to 20 grams of ground oysters was weighed into a tared porcelain dish and ashed at 550° C. until white. (Ash occasionally may be pale blue, or may fuse and remain black, but extra heating should be avoided as it may cause loss of chlorides.)

Chlorides and other soluble salts make up most of the ash of unwashed oysters which may amount to 25 percent of the dry weight for oysters grown in waters of high salinity. The ash content of the washed plant samples is decreased to a degree dependent on the amount of washing with fresh water, and approaches a minimum of roughly 4 percent of the dry weight.

TOTAL CHLORIDES: The method of the AOAC for salt (chlorine as sodium chloride, 8th edition, section 18.9) was used.

The soluble salts in oysters are readily removed during the usual washing operations. Thus a comparison of the total chlorides of the washed and unwashed samples gives an indication of the amount of exposure to fresh water to which the oysters were subjected. The salt content of "shell" oysters varies greatly, depending on the salinity of the waters where the oysters grew. Since Crassostrea virginica is an estuarine species, salinity of water over oyster beds is largely a matter of rainfall on the river system draining into the growing area and may range from extremes in excess of 40 parts per thousand in almost closed bays in Texas or North Carolina to less than 4 parts per thousand in some growing areas in Louisiana or in the upper Chesapeake Bay during flood periods. In fact, fresh water has frequently caused heavy mortality in some oyster-growing areas. In the accompanying data, the extreme range for the salt content on the dry basis of individual samples of shell oysters was 1.0 to 25.4 percent.

The salt content of the washed oysters (the plant sample) is only secondarily influenced by the original salt content. Even unwashed oysters lose one-half or more of their salt content in body fluids released during the time on the shucking bench. Then, the usually limited exposure to fresh water during the washing operations used in South-

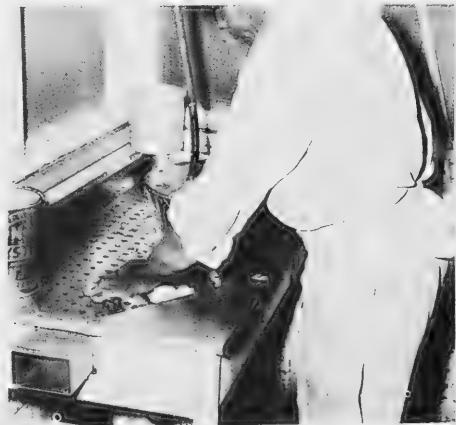


Fig. 4 - In the South, oysters usually receive a brief washing in a pan before packing. Blowers are never used.

ern plants further reduces the salt content of the plant samples, though never to the degree of freshness reached by "blowing" as practiced in the Middle Atlantic States.

In typical estuarine growing areas, seasonal wet and dry spells change water salinities to produce a seasonal pattern of fluctuation in the salt and ash content of the oysters. In the 1955/56 season, as in the preceding year, lack of rainfall during fall and winter months kept oyster salinities high, whereas heavy precipitation during the spring and summer reduced salinities. In September and October 1956, oyster salinities again increased.

CARBOHYDRATES: In these studies glycogen was not determined directly. The difference between 100 and the sum of moisture, protein, fat, and ash has been reported as carbohydrates (by difference). This would include glycogen, its breakdown products, and the accumulative error from the other analyses. Although much less specific, the results obtained by this procedure have shown good correlation to the variation in glycogen that would be expected to result from the spawning and growth patterns of Southern oysters.

The average carbohydrate content of the plant samples is only slightly greater than that of the shell samples. Carbohydrate content evidently does not show the same proportional increase that was observed for the protein and fat content of the plant samples, which resulted from the loss in salt. This observation might indicate that significant amounts of soluble glycogens also are lost in the body fluids. The data for carbohydrates follow the well-known seasonal pattern related to spawning habits. Glycogen is stored during the late fall and early winter and holds over, with little loss, until May or June. Spawning continues during the hot summer period, so there is little recovery of "fatness"--that is, glycogen content--until the cool weather of late fall.

DISCUSSION

The weighted average of 12.6 percent dry solids content for the plant-washed samples of Southern oysters compares favorably with the solids content of oysters from Chesapeake Bay. Unpublished data from the Food and Drug Administration, the senior author, and recent studies of a government-industry research team are in general agreement in the values found for dry solids content of oysters in Chesapeake Bay. Although some washed samples from Chesapeake Bay have a high dry solids content--more than 14.0 percent--this is exceptional. In the early fall, samples with dry solids ranging from about 12.0 to less than 9.0 percent are observed for both the unwashed and plant-washed oysters.



Fig. 5 - Some Southern oyster plants use only a spray wash on the receiving skimmer, thus preserving the natural salty flavor.

The relatively high solids content of Southern oysters is a result of the more limited exposure to fresh water during the washing methods customarily used in the South; that is, spraying the oysters on the delivery skimmer. This treatment is sometimes followed by stirring the oysters gently in a pan or bucket of fresh water. In preparation of samples for analysis the liquor that bled out of the meats after packing was included. Thus values for dry solids content of drained oysters would have

been higher. It is a characteristic of Southern oysters, and occasionally of oysters from certain beds in the Chesapeake Bay area, to form excessive amounts of free liquor within a short time after packing, even when exposure to water has been quite limited. This has greatly complicated enforcement of Section 36.10 of the present U. S. Food and Drug Administration Standards of Identity for raw oysters which defines this product, in part, by its free liquor content.

In January 1959, studies were started by the Government-Industry-Cooperative Oyster Research Program team of the physical and chemical characteristics and changes occurring during processing of oysters in the Chesapeake Bay and other nearby oyster-growing areas. This research has the primary objective of obtaining information useful in revision of current Standards of Identity. The data on composition of Southern oysters obtained in the studies herein reported confirms the necessity for extending the Government-Industry-Cooperative Oyster Research Program investigations to include oysters from the Gulf Coast at the earliest opportunity.

Although the number of samples from most of the Southern States was not sufficient to give a complete pattern of season variation, the data indicate that this pattern is similar in all areas. Unfortunately, the product is at its best when the demand for it is lowest--that is, in the late spring months. The industry would therefore have an advantage if it could operate in such a manner that no oysters would be shucked during September, October, and November. At this time, Southern oysters are still thin, the yield is poor, prices for oysters in the shell are high, and plants often operate at a loss, but the market demands oysters and the plants operate to supply this market. The data illustrate the magnitude of these differences and the need for developing methods, such as freezing, of holding raw shucked oysters from the spring when they are in optimum condition, until the fall increase in market demand. At present, oyster canneries use these spring oysters, but this processed product cannot compete for the same market as the fresh or frozen raw shucked oysters.

CONCLUSIONS

1. The total solids, carbohydrate, and fat contents of the oyster show a seasonal pattern of fluctuation, from high values in the late spring just prior to spawning to low values during the fall just before cooler waters stimulate new growth.
2. The salt and ash contents are related primarily to water salinity, which is influenced by rainfall and other environmental factors that vary for each oyster bed. In the 2 years from October 1954 to October 1956, oysters taken in the fall had higher salinity than those taken in the spring or the summer.
3. As a result of loss of salt during shucking and washing, insoluble constituents of the plant samples--that is, protein and fat--constitute a higher proportion of the remaining solids. The carbohydrate content of washed plant samples increases less than the proportional amount of soluble solids lost, indicating some loss of soluble glycogens during washing. The proportion of the original salt content that remains in the washed oysters depends on the amount of exposure to fresh water during the washing process.
4. Solids content of Southern oysters varies over a wide range, but the average of 12.6 percent for all washed oysters is comparable with that of oysters from Chesapeake Bay.
5. Oysters from all Southern States have a similar pattern of seasonal variability. Benefit to the industry would result through increased production and utilization of oysters during March through May, perhaps by use of freezing if the technical problems were solved.

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LONG SALMON MIGRATIONS

As a part of the International North Pacific Fisheries Commission program, the Fisheries Research Institute has been tagging salmon in the North Pacific Ocean under a contract from the U. S. Bureau of Commercial Fisheries. The objective of the tagging study is to determine the qualitative and quantitative distribution of salmon at sea with respect to continent of origin.

Some amazingly long migrations of salmon and steelhead trout have been recorded from this work. One of the most interesting cases concerns a steelhead which was tagged on September 5, 1958, in the Gulf of Alaska, near Kodiak Island, and recovered February 5, 1960, at a fish cultural station on the Alsea River, Oregon. Personnel at the station state that the fish had been fin-clipped and released in the Alsea River in April 1958. At that time it was approximately 5 or 6 inches in length. At tagging it measured 14 inches and at recovery, 22 inches. Fin clips were not noticed during tagging since time is not taken to watch for missing fins. However, at final recovery, fin clips were still unmistakable. Thus, data on this steelhead (positively identified at three points) revealed its origin, a minimum migration of 2,400 miles round trip, and true homing at maturity.

The longest migrations have been reported from steelhead trout and king salmon. Some of these fish have really traveled. For example, a steelhead tagged south of Adak on July 19, 1957, was recaptured by rod and reel in the Chehalis River, Washington State, on March 13, 1958. The distance traveled was approximately 2,000 miles in 8 months. A king salmon tagged in approximately the same area in 1956 was recovered in the Salmon River, Idaho, the following year. The fish was at liberty 11 months and traveled a minimum of 2,400 miles.

PROCESSING AND QUALITY STUDIES OF SHRIMP HELD IN REFRIGERATED SEA WATER AND ICE

Part 4 - Interchange of the Components in the

Shrimp-Refrigerated-Sea-Water System

By Jeff Collins*

ABSTRACT

Whole raw pink shrimp were held for various periods of time in refrigerated sea water. Data were obtained to determine the effect of holding time on the weights of the whole shrimp and of the sea water and on the weights of peeled meats, of peeling waste, and of precooked meats subsequently prepared from the whole shrimp. In addition, water, salt, ash, and solids content of the above products were determined in order that factors affecting the changes in weight could be better understood.

BACKGROUND

In a previous paper (Seagran, Collins, and Iverson 1960) in which the keeping quality of pink shrimp held in ice and refrigerated sea water was studied, it was found that there was an apparent loss in solids of the peeled meats as a function of holding conditions. It was not known, however, to what degree this loss was caused by leaching of the soluble constituents or by water uptake.

The primary purpose of the present study was to resolve this uncertainty and secondly, to more fully characterize the various changes which occur in the shrimp-brine system. Accordingly, a study was made of the material balance of water, solids, ash, and salt contained in the various components of the system; namely, the brine, whole shrimp, peeling waste, and meats obtained from the whole shrimp, and the precooked meats subsequently obtained from the peeled meats.

The holding system, of course, consists of whole shrimp and 3-percent brine. In the subsequent discussion it is convenient, however, to think of the system as consisting of brine, whole shrimp, peeling waste, peeled meats, and precooked meats. Each of these components of the system will change in its water, solids, ash and salt content as a function of holding time.

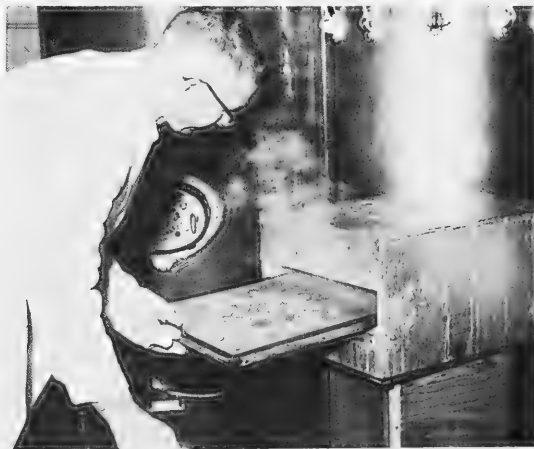


Fig. 1 - Chemist preparing to precook raw peeled shrimp in the laboratory steam box.

EXPERIMENTAL

The general experimental approach was (1) to hold pink shrimp for a period of time in refrigerated sea water, (2) to determine any changes in weight of the whole

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shrimp, its components, or the brine, and (3) to determine the moisture, ash, salt, and solids contents of the components of the shrimp-brine system as a function of holding time.

MATERIAL: About 30 pounds of whole fresh pink shrimp (*Pandalus* species) were obtained from Petersburg, Alaska. The shrimp, which were about 3 hours old when landed at the plant, were iced overnight and shipped by air to the Ketchikan Technology Laboratory. The shrimp were briefly rinsed in cold fresh water and allowed to drain for about 15 minutes in a wire basket.

HOLDING METHOD: Each of 24 glass jars was essentially filled with 450 grams of raw whole pink shrimp and 450 grams of a 3-percent aqueous solution of sodium chloride. The jars were sealed with rubber-gasketed glass lids and held up to 11 days in a pilot-scale refrigerated-sea-water unit at 30° F. (Collins 1960). (The use of a "closed" system was discussed in a previous paper, Collins, Seagran, and Iverson 1960.)

SAMPLING TECHNIQUE: Since the taking of a sample would change the weight of the system, the sampling had to be devised in such a way that this change in weight could be taken into account. The technique was as follows:

1. Three jars were removed from the tank, the contents combined, and the shrimp drained on a wire screen for 5 minutes.
2. The weights of the whole shrimp and brine were obtained separately and samples of both were taken for subsequent analysis. After reweighing, the whole shrimp were carefully hand-peeled so that all meats were separated from the waste.
3. The peeled meats and waste were weighed and a sample of the meats saved. Since the waste was very heterogeneous, the entire waste was blended for 5 minutes in a Hobart Chopper and a sample of the homogenate saved.
4. The reweighed meats were precooked^{1/} for exactly 2 minutes under a slight positive pressure, cooled on a cloth towel for 5 minutes, reweighed, and save for subsequent analysis.
5. All samples were placed in sealed glass jars and held at -20° F. until analyzed.

ANALYTICAL METHODS: The analyses for moisture, total chloride, and ash were carried out as previously described (Collins, Seagran, and Iverson 1960).

RESULTS AND DISCUSSION

The weights of the components of the system and the water, ash, salt, and solids contents of each component are given for each period of holding in tables 1 to 5. In addition, the water, salt, and solids data are illustrated graphically in figures 2 to 4. These weight data have been adjusted so that each value is independent of prior sample removal. The values given for ash are termed "corrected ash" and are obtained by subtracting the salt from the total ash. The solids values do not include ash or salt. The solids, therefore, consist essentially of the nitrogenous components of the shrimp along with a small amount of oil and other minor constituents.

Changes in the various components--whole shrimp, sea water, raw peeled meat, peeling waste, and precooked meat--were as follows:

^{1/}The precook was carried out in a galvanized sheet metal box containing a stainless steel screen on which the peeled meats were spread. Steam at 40 psig was introduced through a copper tube, perforated so as to fill the chamber without subjecting the sample directly to the jets (fig. 1).

WHOLE SHRIMP: The whole shrimp gained weight rapidly when placed in the refrigerated sea water (table 1). This gain in weight was due to the absorption of water and sodium chloride. Accompanying this increase in weight, however, was a decrease in the amount of corrected ash and in the amount of solids. The loss in

Table 1 - Whole Shrimp: Change in Weight of Whole Shrimp and Their Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Whole Shrimp After Various Holding Times	Total Weight of the Components of Whole Shrimp after Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.			
		Water	Chloride	Corrected Ash (Ash-NaCl)	Solids ^{1/}
Days	Grams	Grams	As g. NaCl	Grams	Grams
0	1350	1018	7.2	41.4	283
1	1412	1113	19.8	36.9	243
2	1469	1180	21.0	36.7	231
3	1438	1150	22.0	37.5	228
4	1483	1180	22.4	41.7	239
7	1484	1193	22.7	40.8	227
8	1462	1176	22.5	38.5	225
9	1437	1162	22.5	37.9	215
11	1430	1157	22.7	36.6	214

^{1/}Solids: The total weight of solids, other than ash and NaCl (salt). This solids value is essentially the nitrogenous components plus certain minor constituents. The solids value is obtained by subtracting the water, NaCl, and ash from the total weight of the component for each holding period.

solids was relatively large. By the end of the holding period, about one-fourth of the original weight of solids had been lost, even though the total weight of the whole shrimp was 6-percent higher than the original starting weight.

SEA WATER: Reflecting the over-all increase in the weight of the whole shrimp, the refrigerated sea water lost weight (table 2). This loss in weight was due to the water and sodium chloride that the shrimp had absorbed. Inasmuch as the whole shrimp lost corrected ash and solids, the sea water correctly showed an increase in

Table 2 - Brine: Change in Weight of Brine and Its Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Brine After Various Holding Times	Total Weight of the Components of the Brine after Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.			
		Water	Chloride	Corrected Ash (Ash-NaCl)	Solids ^{1/}
Days	Grams	Grams	As g. NaCl	Grams	Grams
0	1350	1309	40.2	-0.27	1
1	1270	1215	27.5	2.67	26
2	1227	1165	25.1	3.07	34
3	1258	1191	25.3	3.90	38
4	1207	1138	24.0	3.62	42
7	1213	1137	23.6	4.37	48
8	1228	1148	23.8	4.91	52
9	1225	1166	24.0	5.75	55
11	1250	1166	22.7	6.25	56

^{1/}See footnote table 1.

these two constituents. The relations between the weights of water, sodium chloride, and solids and the holding time for both the whole shrimp and the refrigerated sea water are shown graphically in figures 2, 3, and 4.

Table 3 - Peeled Meats: Change in Weight of Peeled Meats and Their Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Peeled Meats After Various Holding Times	Total Weight of the Components of the Peeled Meats After Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.			
		Water	Chloride	Corrected Ash (Ash-NaCl)	Solids ^{1/}
Days	Grams	Grams	As g. NaCl	Grams	Grams
0	470	377	2.5	5.4	85
1	526	432	7.1	4.7	82
2	558	464	8.6	4.8	81
3	556	465	9.3	4.4	77
4	550	460	8.9	4.6	76
7	550	466	9.3	4.5	72
8	543	459	9.0	4.1	71
9	529	447	8.7	4.2	69
11	514	434	8.7	4.1	67

^{1/}See footnote table 1.

RAW PEELED MEAT: Similarly to the whole shrimp, the raw peeled meats gained weight rapidly, owing to the absorption of water and salt (table 3). Again this increase in weight was accompanied by a decrease in the weight of corrected ash and solids. By the end of the holding period, the peeled meats had lost about one-fifth of their solids content, although the total weight of the peeled meats showed a net increase of about 9 percent.

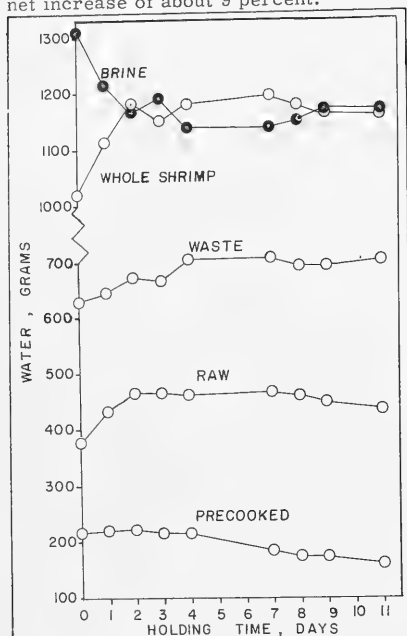


Fig. 2 - The water content of the various components of the shrimp-brine system as affected by the holding time in refrigerated sea water.

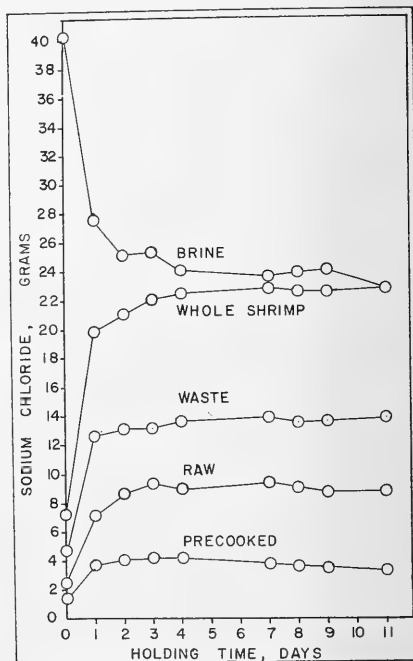


Fig. 3 - The salt content of the various components of the shrimp-brine system as affected by the holding time in refrigerated sea water.

PEELING WASTE: The peeling waste (table 4) constituted about 65 percent of the shrimp. The waste gained up to 5 percent in weight. This increase was due to the absorption of water and sodium chloride. This increase, however, was very nearly balanced by the loss in corrected

Table 4 - Peeling Waste: Change in Weight of Peeling Waste and Its Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Peeling Waste After Various Holding Times		Total Weight of the Components of the Peeling Waste After Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.			
			Water	Chloride	Corrected Ash (Ash-NaCl)	Solids ^{1/}
Days	Grams	Grams	As g. NaCl	Grams	Grams	
0	867	627	4.7	39.9	190	
1	859	643	12.6	35.1	168	
2	885	670	13.1	36.0	166	
3	864	664	13.1	33.9	153	
4	915	702	13.6	35.6	164	
7	904	704	13.8	34.3	152	
8	887	689	13.5	35.3	149	
9	885	689	13.6	33.6	149	
11	893	700	13.8	33.7	145	

^{1/}See footnote table 1.

ash and solids. As in the whole shrimp, about one-fourth of the weight of the original solids was lost. The decrease in corrected ash was probably the result of leaching of carbonate from the shells, for they became rough to the touch.

PRECOOKED MEAT: Reference to figures 2, 3, and 4 show that the precooked meats maintain a constant water content the first few days then decrease in water content, but tend to reach a maximum in absorbed salt and to undergo a continuous decrease in solids content.

Over the 11-day holding period, the precooked meats lost up to 35 percent of their solids content (table 5). Although the data for the raw and precooked meats exhibit almost parallel trends, there is a greater rate of loss from the latter. This greater rate indicates that changes in the raw meats are taking place during holding that result in significant losses of solids during the precook. That this loss may be largely ascribed to leaching of protein-breakdown products during the precook appears to be reasonable, for this view is supported by an earlier finding (Seagran, Collins, and Iverson 1960) that nonprotein nitrogen is continuously being formed at the expense of protein.

Although the percentage composition data are not given for the precooked meats, these data may easily be calculated from the data of table 5. For all practical purposes, the percentage composition of the precooked meats are constant from the 2nd to the 11th day of holding. This indicates that under the conditions of this experiment, the precooked meats will not vary in their water, salt, corrected ash, or solids ratio after the 2nd day of holding.

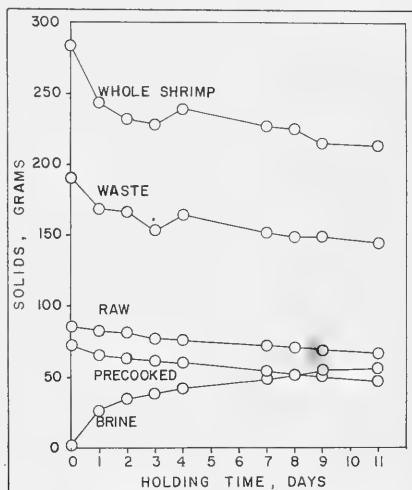


Fig. 4 - The solids content of the various components of the shrimp-brine system as affected by the holding time in refrigerated sea water.

Table 5 - Precooked Meats: Change in Weight of Precooked Meats and Their Component Parts With Time of Holding in Refrigerated Sea Water

Holding Time	Total Weight of Precooked Meats After Various Holding Times	Total Weight of the Components of the Precooked Meats After Holding 1350 g. Whole Shrimp in 1350 g. 3-Percent Brine for Various Times at 30° F.				
		Water	Chloride	Corrected Ash (Ash-NaCl)	Solids ^{1/}	
Days	Grams	Grams	As g. NaCl	Grams	Grams	Grams
0	292	215	1.4	3.2		72
1	292	220	3.7	3.0		65
2	290	220	4.1	3.1		63
3	284	216	4.2	2.6		61
4	281	214	4.2	3.1		60
7	245	184	3.8	3.0		54
8	231	173	3.6	2.9		52
9	230	173	3.5	2.9		51
11	215	161	3.3	2.8		47

1/See footnote table 1.

It is likely that the cut-out weight of commercially-canned shrimp is related to the solids content of the precooked meats as defined here. The loss in yield of the solids in this experiment, therefore, can be equated to a loss in yield in the final number of cases of canned shrimp. An inspection of the data for the solids content of the precooked meats (table 5, fig. 4) shows that an 11-day holding period in refrigerated sea water would result in a 35-percent loss in yield. Even after 4 days,

which is about the maximum time a processor could hold shrimp and still maintain good quality, the yield will drop 17-percent; that is, if 100 cases can be obtained using fresh shrimp, then only 83 cases will be obtained after 4 days' holding. Two days in refrigerated sea water is required for proper machine peeling (Collins 1960). After that time, a processor might expect to experience a yield loss of about 2-percent per day upon additional holding.

SUMMARY

The work reported here was a study of a system of shrimp and refrigerated sea water in which whole raw pink shrimp were held in 3-percent brine (simulated sea water) at 30° F. up to 11 days. The purpose of the work was to determine the effect of holding time on the weight changes of the various components of the holding system (i.e., whole shrimp, brine, peeling waste, peeled meats, and precooked meats). In order that the weight changes could be interpreted, changes in weight of water, salt, corrected ash (ash minus salt), and solids contents were determined for all components.

1. The whole shrimp absorbed water and salt, the rate of absorption being most rapid in the first few days, and lost corrected ash and solids, the rate of this loss also being rapid at the onset. The result of these two opposing tendencies was a net gain in weight for the whole shrimp.

2. The brine reflected a reverse change from the whole shrimp; that is, water and salt were lost, and corrected ash and solids were gained, with the net change in weight of the brine being a loss.

3. The pattern of changes taking place in both the raw peeled shrimp and the peeling waste was similar to that for the whole shrimp.

4. Over the 11-day period, the precooked meats showed a gain in salt content but a loss in corrected ash, solids, and even water; the result was a net loss in weight. As a function of holding time, the precooked meats had a greater rate of loss of solids than did the raw meats. This observation indicates that the holding period resulted in a change in the raw meats so that the solid material became more soluble during the precook.

5. Assuming that the loss in solids, as defined in this experiment (total weight of precooked shrimp minus weight of water, salt, and corrected ash), is related to the yield of commercially-processed shrimp, a processor will suffer a loss of more than 2 cases per 100 for each day the shrimp are held over the minimum time of 2 days required for proper machine peeling.

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RESEARCH

IN SERVICE LABORATORIES

TECHNICAL NOTE NO. 56 - CHEMICAL COMPOSITION AND LABORATORY FILLET YIELD OF 13 SPECIES OF MIDDLE AND SOUTH ATLANTIC FISH

ABSTRACT

Chemical composition of fillets and of fillet waste and laboratory fillet yield are presented for 13 species of fish caught off the coasts of the Middle and South Atlantic States.

INTRODUCTION

Since 1957, a number of miscellaneous determinations have been made at the U. S. Bureau of Commercial Fisheries Technological Laboratory at College Park, Md., on the chemical composition and the laboratory yield of edible meat of certain Middle and South Atlantic fish. The data were taken incidental to the main program of the laboratory and, accordingly, are not extensive. The purpose of this note is simply to make the data available because only limited data have been published on those species.

METHODS AND ANALYSES

In almost all cases, the fish were obtained by laboratory personnel at coastal fishing ports, were frozen for transportation to the laboratory, and were kept frozen until thawed in air at room temperature for analysis. Protein ($N \times 6.25$), ash, and moisture were determined by methods of the Association of Official Agricultural Chemists (1955). Oil was determined by extraction with 92-percent acetone in a Goldfisch extraction apparatus. The extract was dried, the residue extracted with petroleum ether and filtered into a tared beaker, the petroleum ether evaporated, and the residue in the beaker weighed and calculated as oil.



Fig. 1 - Kjeldahl analysis is utilized to determine protein content of fishery products.

Season and location of catch have been included, since these variables are associated with differences in chemical composition of fish (Stansby 1954). When the fish differed considerably in size, the data were arranged according to arbitrary size classifications. The weight of edible meat obtained in the laboratory relative to the weight of fish is presented as fillet yield. Chemical analyses were usually performed on fillets from individual fish, which permitted calculation of the means and standard deviations of the means of the various values. With the fillet waste, analyses were performed on composites. The data are presented in tables 1 and 2.

Table 1 - Physical Characteristics of Middle and South Atlantic Fish

Species of Fish		Number of Samples	Catch Data		Physical Measurements					
					Whole Fish				Fillet Yield	
					Length		Weight		Mean	S.D./	Mean	S.D./
Common Name	Scientific Name	Season	Location	Mean	S.D./	Mean	S.D./	Mean	S.D./	
				(Centimeters)		(Grams)		(Percent)		
Alewife	<i>Pomolobus pseudoharengus</i>	12	Spring	Maryland	26.5	1.2	270	50	42.7	2.8
Butterfish	<i>Poronotus triacanthus</i>	4	Summer	Maryland	-	-	110	12	82.8	1.1
Croaker	<i>Micropogon undulatus</i>	4	Summer	Maryland	-	-	284	57	46.0	12.0
		2	Winter	Virginia	30.8	-	494	-	26.7	-
Flounder	<i>Pseudopleuronectes americanus</i>	5	Summer	Maryland	-	-	342	80	51.0	16.0
Grey sea trout	<i>Cynoscion regalis</i>	6	Winter	Virginia	22.8	2.2	175	35	40.7	2.5
King whiting (ground mullet)	<i>Menticirrhus saxatilis</i>	3	Spring	Maryland	-	-	317	70	37.0	3.5
		4	Summer	Maryland	-	-	220	-	35.3	-
		3	Winter	Virginia	26.8	-	351	-	42.6	-
		9	Spring	Georgia	25.1	2.2	176	64	39.0	2.4
Mullet	<i>Mugil cephalus</i>	6	Spring	Maryland	-	-	266	62	32.3	1.8
		5	Spring	Georgia	20.2	1.0	104	15	31.4	3.3
Scup (porgy)	<i>Stenotomus chrysops</i>	6	Spring	Maryland	-	-	514	170	32.5	3.8
		4	Spring	Virginia	29.2	0.8	565	50	30.9	5.4
Sea bass	<i>Centropomus striatus</i>	5	Spring	Maryland	-	-	443	64	32.8	1.3
		5	Winter	Virginia	25.7	1.8	452	88	30.0	2.0
		5	Winter	Virginia	20.8	0.7	258	26	35.8	2.8
Shad	<i>Alosa sapidissima</i>	6	Spring	Maryland	-	-	1,456	244	45.0	3.7
		2	Spring	Georgia	41.5	-	1,383	-	41.6	-
		2	Spring	Delaware	47.4	-	1,343	-	45.9	-
Spanish mackerel	<i>Scomberomorus maculatus</i>	5	Spring	Florida	42.8	3.0	607	100	58.6	2.5
Spot	<i>Leiostomus xanthurus</i>	4	Summer	Maryland	-	-	151.	28	80.0	14.0
Striped bass	<i>Roccus saxatilis</i>	5	Spring	Maryland	29.5	0.7	314	7	36.2	1.4
		4	Spring	Maryland	43.0	1.9	966	79	35.1	1.5

1/Standard deviation of the mean.

Table 2 - Chemical Composition of Middle and South Atlantic Fish Fillets and Fillet Waste

Species of Fish	Number of Samples	Chemical Composition															
		Protein				Oil				Ash				Moisture			
		Fillet		Waste		Fillet		Waste		Fillet		Waste		Fillet		Waste	
		Mean	S.D./	Mean	S.D./	Mean	S.D./	Mean	S.D./	Mean	S.D./	Mean	S.D./	Mean	S.D./	Mean	S.D./
		(Percent)															
Alewife	12	17.5	0.6	15.6	4.8	1.6	10.1	1.2	0.0	3.1	76.4	1.6	70.2				
Butterfish	4	17.9	1.1	14.4	0.9	0.3	4.6	1.2	0.1	2.8	80.4	0.5	77.4				
Croaker	4	17.5	0.3	15.7	2.9	0.5	8.0	1.1	0.1	5.7	78.0	0.7	69.8				
Flounder (blackback)	2	14.1	-	14.3	0.4	-	0.4	0.9	-	7.1	84.3	-	77.5				
	5	19.9	1.5	16.3	0.3	0.1	2.2	1.2	0.1	5.4	79.5	0.3	75.4				
Grey sea trout	6	15.7	1.3	13.6	4.2	1.9	10.8	1.3	0.2	3.1	78.2	1.3	74.5				
King whiting (ground mullet)	4	16.6	0.2	14.0	0.7	0.1	1.1	1.0	0.1	3.6	81.7	0.3	80.6				
	3	17.5	-	15.2	1.0	-	5.5	1.1	-	3.4	80.3	-	75.0				
	3	16.5	-	14.3	6.1	-	11.0	1.1	-	3.6	76.3	-	70.6				
Mullet	9	17.9	0.7	16.5	2.6	1.3	6.5	1.1	0.1	4.5	78.6	1.4	71.2				
	6	18.1	0.8	17.3	0.2	0.1	1.2	1.0	0.0	8.6	80.2	0.6	72.0				
Scup (porgy)	5	19.0	0.9	18.4	2.0	0.8	6.4	1.2	0.1	5.0	77.4	1.1	70.4				
	6	18.9	0.8	15.7	5.9	1.7	14.2	1.2	0.1	7.2	73.6	2.1	61.0				
Sea bass	4	18.4	0.1	14.3	4.8	0.4	15.0	1.1	0.0	6.4	75.1	0.6	62.6				
	5	18.2	0.6	16.7	0.8	0.3	5.3	0.9	0.1	6.3	79.5	0.4	69.8				
	5	18.5	0.5	15.6	3.0	1.0	9.5	1.0	0.1	2.9	77.8	0.6	73.2				
Shad	5	18.0	0.4	14.3	1.3	0.4	6.1	1.1	0.0	3.2	78.8	0.5	74.3				
	6	15.7	1.6	13.8	15.2	2.4	19.9	1.3	0.1	3.2	67.5	2.7	61.4				
	2	17.5	-	20.7	9.0	-	11.5	1.2	-	3.4	71.3	-	63.8				
Spanish mackerel	2	16.7	-	15.5	13.2	-	17.6	1.3	-	3.6	68.4	-	63.0				
	5	17.6	0.9	16.0	6.8	1.8	12.4	0.9	0.1	3.6	74.6	1.8	67.4				
Spot	4	17.9	0.6	14.8	3.1	0.8	10.6	1.1	0.1	4.6	77.5	0.6	68.9				
Striped bass	5	16.6	0.4	15.7	1.5	1.3	4.4	1.0	0.0	4.9	80.7	0.5	74.0				
	4	18.8	0.3	16.4	2.9	0.6	12.1	1.1	0.1	4.9	77.9	0.6	66.0				

1/Standard deviation of the mean.

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SEASONAL VARIATIONS OF PHYSICAL CHARACTERISTICS AND CHEMICAL COMPOSITION OF FISH FROM MIDDLE ATLANTIC STATES

By John G. Wangler*

ABSTRACT

Sea bass (*Centropristes striatus*), flounder or blackback (*Pseudopleuronectes americanus*), fluke (*Paralichthys dentatus*), and scup or porgy (*Stenotomus chrysops*) were obtained in the fresh state from both spring and summer catches at New Jersey coastal ports and the New York City Fulton Fish Market. Data were obtained on the size of the fish; on the percentage yields of fillet, head, frame, viscera, skin, and scales; and on the moisture, protein, oil, and ash contents of those component parts.

INTRODUCTION

An investigation to determine the physical characteristics and chemical composition of various species of fish obtained from the waters of the Middle Atlantic States is being made by the staff of the U. S. Bureau of Commercial Fisheries Technological Laboratory, College Park, Md. Such information is of value to fish processors, nutritionists, and members of the medical profession. The chemical composition of the nonedible portion of fish is of value in the pet-food and other animal-feed industries.

Variations in physical characteristics and chemical composition are considered important, since it has been generally realized for some time that these factors differ considerably, not only from species to species but often to an even greater extent from one fish to another of the same species. These variations--according to Atwater (1892), Tressler and Lemon (1951), and Stansby (1954)--may be due to the season of the year when the fish are caught, the geographical area in which the fish are located, the age of the fish, or other factors that have not been identified. For composition data to be of real value, then, it is necessary to determine the extent of differences that may exist.

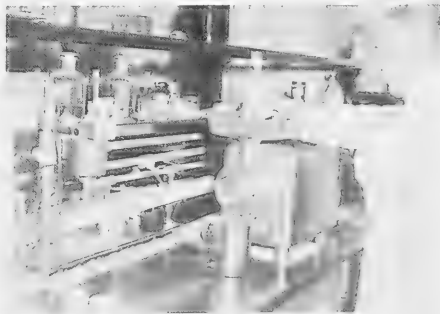


Fig. 1 - To prepare samples, a Hobart grinder is used.

In this report information is presented on the seasonal variations in the physical measurements and the chemical composition of four species of commercially-important fish of the Middle Atlantic States.

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EXPERIMENTAL PROCEDURE AND RESULTS

SAMPLING: Fresh fish were obtained from both spring and summer catches from New Jersey coastal ports and the New York City Fulton Fish Market. The species were sea bass (*Centropristis striatus*), flounder or blackback (*Pseudopleuronectes americanus*), fluke (*Paralichthys dentatus*), and scup or porgy (*Stenotomus chrysops*). The fish were packed in ice and transported to the laboratory, where they were stored in polyethylene bags at approximately -12°C . (10.4°F .) until analyzed.

PHYSICAL MEASUREMENTS: After being thawed at room temperature (no drip occurred), each fish weighed and measured for length, depth, and thickness. Length was determined by measuring the fish from the snout to the tip of the tail. Individual weights were determined for the whole fish and for various component parts of the fish, including fillet, viscera, frame, head, skin, and scales. The term frame is used to indicate the total weight of the beheaded skeleton after filleting, and includes tail,

Table 1 - Physical Measurements and Yields of Component Parts of Middle Atlantic Fish

Description of the Whole Fish Species	Season Catch	Item	Physical Characteristics of the Whole Fish				Yield of Component Parts							
			Length (Centimeters)	Depth	Thickness	Weight Grams	Fillet	Viscera	Frame	Head	Skin	Scales	Loss	
Sea bass ^{1/} (<i>Centropristis striatus</i>)	Spring	Mean of 9 fish	33.5	8.9	4.9	522	33.5	3.3	16.0	36.0	6.8	2.5	1.9	
		Standard deviation	2.4	0.6	0.5	86	3.1	0.5	1.3	2.5	0.8	0.4	0.4	
	Summer	Mean of 9 fish	38.9	11.1	6.3	866	35.4	6.4	15.7	27.3	6.6	2.6	1.7	
		Standard deviation	2.3	0.5	0.5	111	3.7	2.5	2.7	3.4	2.1	0.4	0.5	
			Significance of F test ^{2/}	6/	6/	6/	6/	None	6/	None	6/	None	6/	None
		Seasonal difference of means	5.4	2.2	1.4	244	1.9	3.1	9.3	11.3	0.2	0.1	0.2	
Flounder or blackback ^{2/} (<i>Pseudopleuronectes americanus</i>)	Spring	Mean of 8 fish	35.9	14.7	2.9	594	24.9	10.4	30.3	14.7	12.2	0.9	6.7	
		Standard deviation	1.2	0.2	0.2	131	4.8	3.2	2.0	0.8	2.2	0.2	1.4	
	Summer	Mean of 6 fish	54.0	21.6	4.9	2,189	49.0	8.5	16.5	9.2	13.7	1.8	2.3	
		Standard deviation	0.8	0.3	0.1	116	2.0	1.3	1.5	1.1	1.0	0.4	0.8	
			Significance of F test	6/	6/	6/	6/	None	6/	6/	6/	6/	6/	6/
		Seasonal difference of means	17.1	5.9	2.0	1,595	25.1	1.9	13.9	5.5	1.5	0.9	4.4	
Fluke ^{3/} (<i>Paralichthys dentatus</i>)	Spring	Mean of 8 fish	44.3	16.3	3.2	904	39.0	1.8	26.8	19.8	9.1	1.7	1.8	
		Standard deviation	2.0	0.7	0.3	107	2.5	0.4	1.2	1.7	1.6	0.5	0.4	
	Summer	Mean of 6 fish	50.7	19.1	2.8	1,438	47.3	5.6	18.6	15.8	7.4	1.8	3.5	
		Standard deviation	2.1	0.7	0.1	128	1.7	0.3	1.0	1.6	0.9	0.3	0.8	
			Significance of F test	6/	6/	6/	6/	6/	6/	6/	6/	6/	6/	6/
		Seasonal difference of means	6.4	2.8	0.6	534	8.3	3.8	8.2	7.0	0.7	0.1	1.7	
Scup or porgy ^{4/} (<i>Stenotomus chrysops</i>)	Spring	Mean of 8 fish	33.0	11.8	4.4	685	30.6	7.1	20.3	30.7	6.4	3.5	1.2	
		Standard deviation	2.4	0.5	0.5	133	2.7	1.6	1.9	1.3	1.1	0.5	1.0	
	Summer	Mean of 7 fish	30.0	10.5	3.7	474	31.8	8.4	14.3	30.3	6.5	4.8	3.4	
		Standard deviation	1.5	0.7	0.2	88	1.1	1.3	1.6	1.3	0.7	0.9	1.3	
			Significance of F test	6/	6/	6/	6/	None	6/	None	6/	None	6/	6/
		Seasonal difference of means	3.0	1.3	0.7	191	1.3	1.3	2.0	0.4	0.1	1.4	2.1	

^{1/}Spring catch obtained in April 1958, near Cape May, N. J.; summer catch in July 1958, near Williston, N. J.

^{2/}Spring catch obtained in April 1958, near Monmouth Beach, N. J.; summer catch in September 1958, from the Fulton Fish Market, New York City, and fish were caught off southern Massachusetts.

^{3/}Spring catch obtained in April 1958, near Cape May, N. J.; summer catch in September 1958, from the Fulton Fish Market, New York City, and fish were caught off southern Massachusetts.

^{4/}Spring catch obtained in April 1958, near Atlantic City, N. J.; summer catch in July 1958, near Atlantic City, N. J.

^{5/}Indicates a significant difference between spring and summer values at a 5-per cent level of probability.

^{6/}Indicates a significant difference between spring and summer values at a 1-per cent level of probability.

^{7/}A statistical test used to determine if differences between measurements may be considered as real.

vertical and dorsal fins, and adhering meat. The term loss is used to indicate the total weight of each fish less the determined sum of the weights of all component parts of that fish. A percentage yield of component parts was determined by dividing the weight of each component part by the total weight of each fish and multiplying by 100. Data obtained on the physical measurements are tabulated in table 1.

CHEMICAL ANALYSES: The fillets of each fish were individually ground in a Hobart grinder, ground further in a Lourdes multimixer, and stored in glass jars at -10°C . (14°F .) until analyzed. Composites of the inedible component parts were similarly prepared for analysis.

Moisture, protein (N x 6.25), and ash determinations were conducted according to methods of analysis of the Association of Official Agricultural Chemists (1955). The oil content was determined by a slight modification of the method of Damberg (1956). The method used consisted of extraction of the sample with a mixture of 92 percent acetone and 8 percent water for 4 hours in a Goldfish fat extraction apparatus. The solvent mixture then was evaporated, and the residue was dissolved in petroleum ether. The solution was filtered through No. 42 Whatman filter paper, the petroleum ether was evaporated, and the residue was weighed and calculated as oil. Data on chemical composition are tabulated in tables 2 and 3.

Table 2 - Chemical Composition of Fillets From Middle Atlantic Fish

Description of the Fish Species	Season of Catch	Item	Proximate Composition			
			Moisture	Protein	Oil	Ash
Sea bass (<i>Centropristes striatus</i>)	Spring	Mean of fillets from 9 fish	78.5	18.9	1.62	1.15
		Standard deviation	1.2	0.7	1.04	0.10
	Summer	Mean of fillets from 9 fish	77.3	18.3	2.92	1.20
		Standard deviation	1.1	0.5	1.43	0.06
	Significance of F test		1/	None	1/	None
Seasonal difference of means		1.2	0.6	1.30	0.05	
Flounder or blackback (<i>Pseudopleuronectes americanus</i>)	Spring	Mean of fillets from 6 fish	80.8	17.1	0.23	1.29
		Standard deviation	0.9	0.5	1.11	0.12
	Summer	Mean of fillets from 6 fish	75.4	19.9	0.83	1.21
		Standard deviation	0.5	0.9	0.46	0.05
	Significance of F test		2/	2/	1/	None
Seasonal difference of means		5.4	2.8	0.60	0.08	
Fluke (<i>Paralichthys dentatus</i>)	Spring	Mean of fillets from 6 fish	79.7	18.8	0.32	1.08
		Standard deviation	0.7	0.9	0.12	0.21
	Summer	Mean of fillets from 6 fish	76.8	20.0	1.02	1.13
		Standard deviation	0.6	0.4	0.41	0.08
	Significance of F test		2/	1/	2/	None
Seasonal difference of means		2.9	1.3	0.70	0.05	
Scup or porgy (<i>Stenotomus chrysops</i>)	Spring	Mean of fillets from 8 fish	75.4	18.9	4.06	1.20
		Standard deviation	1.0	0.5	1.19	0.07
	Summer	Mean of fillets from 7 fish	77.0	19.1	1.21	1.30
		Standard deviation	0.6	0.4	0.61	0.11
	Significance of F test		2/	None	2/	2/
Seasonal difference of means		1.6	0.2	2.85	0.10	

1/Indicates a significant difference between spring and summer values at a 5-percent level of probability.

2/Indicates a significant difference between spring and summer values at a 1-percent level of probability.

Table 3 - Chemical Composition of Inedible Components From Middle Atlantic Fish

Description of the Fish Species	Season of Catch	Component- ^{1/}	Proximate Composition				
			Moisture	Protein	Oil	Ash	
Sea bass (<i>Centropristes striatus</i>)	Spring	Viscera	74.8	14.7	7.98	1.45	
		Frame	69.8	15.7	6.22	7.45	
		Head	69.7	16.2	5.03	7.40	
		Skin	73.4	19.9	6.43	0.87	
		Scales	62.4	22.6	0.08	14.50	
		Roe	-	-	-	-	
	Summer	Viscera	76.5	13.0	6.91	1.40	
		Frame	66.3	17.4	7.73	8.41	
		Head	70.4	16.6	5.31	7.85	
		Skin	68.7	21.7	9.61	1.45	
		Scales	44.1	30.3	0.42	25.83	
		Roe	76.5	16.9	3.82	1.55	
	Flounder or blackback (<i>Pseudopleuronectes americanus</i>)	Spring	Viscera	81.4	10.1	2.79	2.41
			Frame	77.0	16.6	1.11	6.93
Head			75.2	15.8	1.74	6.13	
Skin			77.1	19.7	0.89	1.49	
Scales			62.9	21.4	0.46	15.17	
Summer		Viscera	71.1	12.9	9.39	3.99	
		Frame	67.5	18.1	7.40	7.41	
		Head	69.9	16.5	5.87	6.13	
		Skin	68.2	18.9	11.01	1.69	
		Scales	61.1	24.3	0.35	14.83	
Fluke (<i>Paralichthys dentatus</i>)	Spring	Viscera	82.4	13.0	1.43	1.11	
		Frame	76.6	15.7	2.20	4.82	
		Head	73.0	17.2	3.34	6.04	
		Skin	75.7	20.9	1.05	0.95	
		Scales	53.5	28.8	0.17	18.53	
	Summer	Viscera	78.5	13.5	5.19	1.17	
		Frame	67.1	18.0	6.92	6.91	
		Head	69.2	17.6	5.35	7.49	
		Skin	69.0	23.6	6.45	1.38	
		Scales	49.1	33.2	0.31	18.96	
Scup or porgy (<i>Stenotomus chrysops</i>)	Spring	Viscera	70.1	12.1	6.93	7.18	
		Frame	60.9	17.3	15.64	6.81	
		Head	61.2	15.5	13.98	8.93	
		Skin	61.1	18.3	20.79	0.93	
		Scales	37.9	30.3	0.46	33.12	
	Summer	Viscera	73.1	13.0	2.88	6.42	
		Frame	58.2	17.1	8.63	6.47	
		Head	67.9	15.9	7.19	9.43	
		Skin	64.2	23.5	6.98	2.16	
		Scales	35.2	33.4	0.18	29.37	
Roe	-	-	-	-			

1/Composites of each component part.

DISCUSSION

VARIATIONS IN PHYSICAL MEASUREMENTS: Within each species, individual fish varied in size and percentage yield of the component parts. Of the 4 species studied, 3 from the summer catch--sea bass, flounder, and fluke--were larger than the same species from the spring catch. On the other hand, scup or porgy were larger in the spring.

Any difference in size of fish was accompanied by differences in the weight of the component parts. However, the changes in weight were not proportional to changes in the size of the fish. Therefore, the percentage yields of the different component parts varied seasonally. Generally, spring-caught fish contained higher percentage of frame and head coupled with lower percentage of viscera and fillet compared to the summer-caught fish. An exception was noted for scup, where seasonal differences were small in the proportions of the component parts.

VARIATIONS IN CHEMICAL COMPOSITION: The mean oil content of sea bass, flounder, and fluke was significantly lower for the spring catch as compared to the summer catch and was accompanied by a correspondingly higher moisture content. A similar relationship existed between the oil content and the moisture content of scup except that in this case, a significantly greater oil content and a correspondingly lower moisture content were obtained in the spring catch as compared to the summer catch. Similar ratios of oil and water content were reported by Clark and Almy (1920).

The mean protein content of flounder, fluke, and scup for the summer catch was significantly greater than that for the spring catch. The seasonal differences in the mean protein content for sea bass and ash content of the four species were not significant within species.

SUMMARY

Results obtained from the study of the seasonal differences in physical measurements and chemical composition of four species of Middle Atlantic fish indicated that sea bass, flounder, and fluke caught in the summer were larger than these species from the spring catch. The mean size of scup from the spring catch, however, was larger than that of fish from the summer catch. Seasonal changes in yield of component parts were not proportional to changes in the size of the fish. Important differences noted in chemical composition were significantly higher oil content coupled with lower moisture content for summer-caught sea bass, flounder, and fluke and spring-caught scup as compared with spring-caught sea bass, flounder, and fluke, and summer-caught scup.

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TRENDS AND DEVELOPMENTS

American Samoa

TUNA LANDINGS, JANUARY-APRIL 1960:

Tuna landings by Japanese and South Korean fishing vessels for the United States-owned tuna cannery in American Samoa amounted to 1,475,000 pounds in March and 2,094,000 pounds in April 1960. The January-April 1960 total of 9,150,000 pounds was up about 10.7 percent from the 8,267,000 pounds landed in the same period of 1959.

Species	March		April		Jan.-Apr.	
	1960	1959	1960	1959	1960	1959
Albacore	1,476	1,357	1,722	1,793	7,702	6,277
Yellowfin	247	392	254	436	1,123	1,635
Big-eyed	52	97	112	142	315	355
Skipjack	1/		6	1/	10	1/
Total	1,475	1,846	2,094	2,371	9,150	8,267

1/ Less than 500 pounds.

Notes: Majority of the tuna was landed by Japanese long-line vessels; some was landed by South Korean and Samoan long-line vessels.



California

ATTEMPT BEING MADE TO RESTORE SOUTHERN CALIFORNIA KELP BEDS:

In order to restore the Southern California coast's once valuable kelp beds, warm-water kelp is being planted. The kelp beds are near extinction because of damage caused by three years of sub-normal water temperatures. The kelp that is being planted is brought from off the coast of Lower California, Mexico.

A University of California biologist states that a few plants are being planted in the hope that if the water continues warm, the spores will hold and grow.

The spores normally float up from the south during warm water periods. Divers transplant the southern kelp by tying it to rocks with nylon cords, to hold it until it attaches itself.

* * * * *

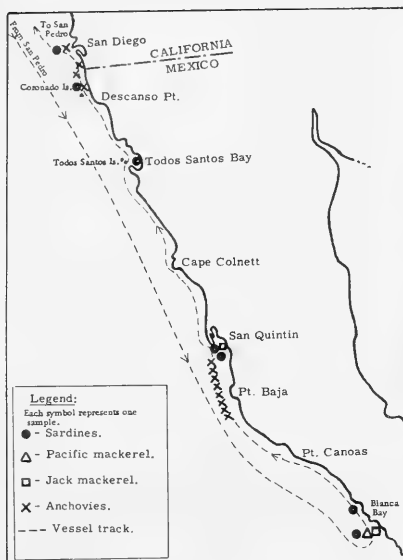
PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 60A3-Pelagic Fish: The coastal waters off northern Baja California, Mexico, and southern California from Playa Maria Bay, Mexico, northward to San Diego were surveyed (March 18-April 5, 1960) by the California Department of Fish and Game research vessel Alaska, to obtain live sardines for genetic studies in cooperation with the U. S. Fish and Wildlife Service. The genetic studies include (a) serological tests to delimit the ranges of sardines possessing northern and southern blood "types" (prior to the 1959 sardine fishing season the "northern type" was found off central California and the "southern type" off southern California. Since the 1959 season opened in September, all sardine samples collected off California have been of the northern type. Sardines collected in the area extending from Sebastian Vizcaino Bay southward to Magdalena Bay on the February 1960 Pelagic Fish Cruise 60A2 were of the southern type); and (b) detailed morphometric studies, on the above fish, to find morphological characters which may be related to genetic types. Other objectives were (1) to experiment with Japanese mercury vapor lights as a means of improving fish attraction to lights; (2) to make preliminary gear experiments to improve pelagic fish sampling; and (3) to sample sardines, Pacific mackerel, jack mackerel, and anchovies to determine their distribution, relative number, and their ages.

Live sardines were collected in Sebastian Vizcaino Bay, San Quintin Bay, and Todos Santos Bay. An additional live sardine sample was obtained from a Mexican bait hauler at Ensenada. Although all blood tests have not been completed, the Ensenada sample was found to consist of northern-type fish.

From a total of 66 light stations, 6 sardine, 4 anchovy, 2 jack mackerel, and one Pacific mackerel samples were taken.

The vessel scouted 303 miles during which 358 anchovy, one sardine, and one Pacific mackerel schools were observed. Anchovies were seen in large quantities between Sacramento Reef and Cape San Quintin. In addition to the anchovy schools



M/V Alaska Cruise 60A3-Pelagic Fish (March 10-April 5, 1960.)

counted, there were nearly continuous bands of anchovies which were not separate enough to count. These fish were about 3 to 4 inches in length and were negatively phototropic. (Fish did not respond to light stations made in the area of school groups.)

On 14 light stations a 500-watt Japanese mercury vapor lamp was compared with a 1,500-watt incandescent light for relative fish attraction effectiveness. The lights were suspended over the water with a mercury vapor lamp placed amidships on one side of the vessel and an incandescent lamp placed in a corresponding location on the opposite side. The lights were turned on simultaneously and burned about one hour at each station. Although both types attracted sardines, anchovies, sauries, and pelagic red crabs, the animals did not show a preference for either. More extensive tests are planned.

A different method of catching fish under the light was tried by using a modified lampara net. Results provided ideas for further experimentation. An experimental set with a variable mesh gill net successfully captured 100 sardines and 4 barracuda of a deep school in a 15-minute set.

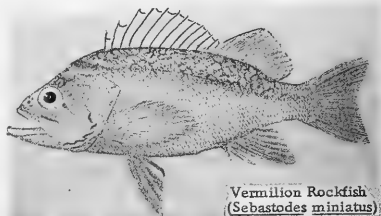
Sea-surface temperatures ranged from 54.1° F. at Cape Colnett to 62.5° F. at Point Descanso. A large number of readings ranged between 57° and 59° F.

Note: Also see Commercial Fisheries Review, June 1960, p. 22.

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ROCKFISH STUDY OFF SOUTHERN CALIFORNIA COAST CONTINUED:

M/V "Nautilus" Cruise 60N1-Rockfish: The inshore waters around Santa Barbara Island were surveyed by the California Department of Fish and Game research vessel Nautilus on January 18-22, 1960, to obtain sub-adult and young adult sizes of the vermilion rockfish (*Sebastes miniatus*) for determining size and age at maturity.



Fifty vermilion rockfish, in the desired size range, were obtained by hook-and-line fishing. These were caught on the bottom at a depth of 30-35 fathoms off Santa Barbara Island. Scales and otoliths were taken from all specimens.

Information was obtained on other species of rockfish. Whitebelly rockfish (*S. vexillaris*) were the most abundant species found in association with vermilion rockfish.

Ocean whitefish (*Caulolatilus princeps*) were frequently caught just above the bottom; and numbers of Pacific mackerel (*Pneumatophorus diego*) were taken at midwater depth.

* * * * *

CALIFORNIA HALIBUT TAGGING STUDIES OFF SOUTHERN AND BAJA CALIFORNIA:

M/V "Nautilus" Cruise 60N2-Sportfish: The area off southern California from Ventura to Oceanside was surveyed by the California Department of Fish and Game's research vessel Nautilus on February 11-18, 1960, to secure California halibut (*Paralichthys californicus*) for (a) tagging; (b) morphometric studies; and (c) length-weight and age studies. Other objectives were (1) to collect samples of other species found in association with California halibut; and (2) to determine the relative abundance of California halibut inside and outside of the three-mile limit in certain areas.

A total of 81 hauls with a trawl net produced 888 California halibut for tagging. An additional 1,494 halibut were captured but were considered too small (smaller than 15½") or were in too poor a condition for tagging. All of the large damaged fish and samples of the smaller fish were saved for morphometric and food and age studies.

The California halibut tagged averaged 19½ inches in length and 20 percent were of commercial legal size (22 inches). This percentage was more than twice that encountered during 1959 trawling. Nine halibut were tagged off Oceanside, 561 in the

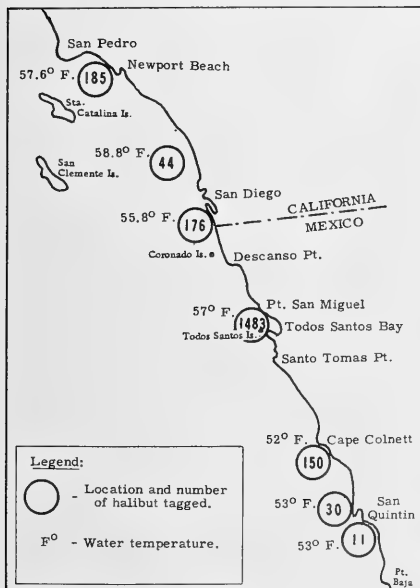
Newport-Long Beach area, 124 off Zuma Beach and 194 off Hueneme.

Fishing operations were hampered in the Zuma Beach area by vast quantities of broken kelp fronds and holdfasts that were picked up from the bottom by the trawl net. Dragging in the same area and depth later produced large quantities of kelp but the pieces were noticeably smaller.

In most cases, all bony fish other than California halibut were saved and processed at the California State Fisheries Laboratory. Lengths, weights, sex, and state of maturity were obtained for most of the 1,926 specimens saved.

M/V "N. B. Scofield" and "Nautilus" Cruises 60S1 and 60N3-Sportfish: The inshore waters from Huntington Beach, Calif., to San Quintin Bay, Baja Calif., were surveyed (March 2-20, 1960) by the Department's research vessels N. B. Scofield and Nautilus (1) to obtain California halibut (*Paralichthys californicus*) for tagging, length-weight-age-maturity data, morphometric studies, and study of food habits; and (2) to collect samples of ocean life found in association with halibut.

The N. B. Scofield and the Nautilus were able to complete 168 drags with trawl nets. Of 3,189 California halibut taken, 2,079 were tagged. Fish shorter than 15½ inches total length were not tagged unless in unusually good condition. The greater portion of the California halibut tagged up to this year have been of the smaller sizes and additional



M/V N. B. Scofield and Nautilus Cruises 60S1 and 60N3 March 2-20, 1960.)

small fish were not needed. A total of 400 of those tagged were 22 inches or longer (commercial size limit 22 inches).

Approximately 1,400 pounds of fish and shellfish caught along with the California halibut were retained for laboratory examination. One shovel-nose guitarfish (*Rhinobatus productus*) was larger than any previously examined.

Diamond turbot (*Hypsopsetta guttulata*), horny-head turbot (*Pleuronichthys verticalis*), and fantail sole (*Xystreurys loiepis*) were the most common bony fish found associated with California halibut. In some areas, usually where the warmest water prevailed, large catches of the various flatfish, shovel-nose guitarfish, bat ray (*Myliobatis californicus*), and thornback (*Platyrrhinoidis trisenata*) were taken. Frequently, one or two electric rays (*Torpedo californica*) and angel sharks (*Squatina californica*) were included. Angel sharks appear to be a serious predator on halibut, as a number of halibut had scars of angel shark bites in various stages of healing.

Sharks, skates, and rays were counted and jet-tisoned. Shovel-nose guitarfish were most numerous followed by bat rays. Totals were: shovel-nose 1,668, bat ray 860, thornback 584, butterfly ray (*Gymnura marmorata*) 130, angel shark 98, diamond stingray (*Dasyatis dipterura*) 35, and electric ray 12.

Two large female angel sharks gave birth to a number of live young when boated. One yielded 11 young, the highest count. All were active and able to swim immediately.

Round stingrays (*Urolophus haller*), very common in California waters, were seldom caught in Mexico. Round stingrays cause considerable sting damage to all species of fish when confined together in the trawl net. Bat rays on the other hand do little sting damage, but their bulk and weight may harm fish that need to be in good shape for tagging.



Cans--Shipments for Fishery Products

BY AREA IN 1959:

In 1959, out of total shipments of 115,479 tons of steel for use in the manufacture of cans for fishery products, the Pacific Area (including Hawaii)--where the tuna, California, and salmon canneries are concentrated--utilized 81,809 tons

or 70.8 percent. The Pacific Area was followed by the Eastern Area (New Eng-



land, Middle Atlantic, South Atlantic, and Puerto Rico) with 29,299 tons or 25.4 percent. The Maine sardine canneries are concentrated in New England and a tuna cannery operates in Puerto Rico. The Central Area (includes Gulf States)--where the bulk of the shrimp-canning industry is concentrated--used only 4,371 tons or 3.8 percent. The over-all total of 115,479 tons was down 6.6 percent from the preceding year due primarily to a sharp drop of 8.4 percent in the amount of steel used for fish cans in the Pacific Area where the packs of California sardines and salmon were down.

Shipments of steel for the manufacture of cans for fishery products on a quarterly basis were heaviest during the third quarter for the Eastern and Pacific Areas, but for the Central Area the heaviest shipments were made in the second quarter. In the east, 37.5 percent or 10,990 tons out of a total of 29,299 tons were consumed in the third quarter. The Pacific Area used 26,775 tons (32.7 percent of the 81,809-ton total) during the third quarter. The Central Area used 1,740 tons (39.8 percent) in the second quarter and 1,485 tons (34.0 percent) in the third quarter.

Note: Also see Commercial Fisheries Review June 1959 p. 33.

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JANUARY-MARCH 1960:

Total shipments of metal cans during January-March 1960 amounted to 22,023 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 19,457 tons in the same period a year ago. Canning of fishery products in January-March this year was confined largely to tuna, Gulf oysters, and Pacific jack mackerel. Increased shipments of metal cans during January-March this year as compared with the same months in 1959 were probably due to the sharp increase in the California pack of canned jack mackerel.

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.



Central Pacific Fisheries Investigations

FUTURE RESEARCH ON PACIFIC TUNAS POINTED TOWARDS SOLUTION OF PRACTICAL PROBLEMS:

During the first ten years (1950-1959), the oceanographic, marine biological, and fishery research conducted by the U. S. Bureau of Commercial Fisheries Hono-

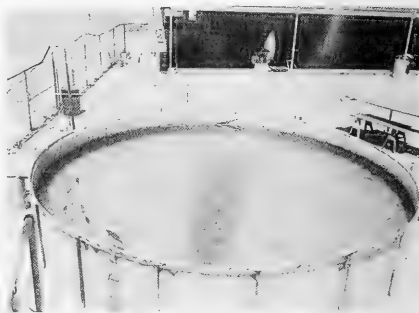


Fig. 1 - Tank at Bureau of Commercial Fisheries Honolulu Biological Laboratory where behavior of skipjack tuna is being studied. Note small skipjack swimming on left side of tank.

lulu Biological Laboratory was primarily exploratory in nature. Studies were made of the distribution and abundance of deep-swimming yellowfin, big-eyed, and albacore tuna in the Central Pacific equatorial region (1950-1956), of both surface and deep-swimming albacore in the North Central and Northeastern Pacific (1954-1960), and of surface school skipjack in the Northeastern French Oceania or the Marquesas (1956-1960), and in Hawaiian waters (1952 to present). In each of the areas, studies covered oceanographic observations, plankton and forage samples, and tuna biology studies, including spawning, life history, growth, and migration. Various descriptive and analytical reports describing these studies have been published. The final series of reports for the North Pacific albacore and the Marquesan studies are scheduled for publication during 1960.

Completion of the exploratory phases has resulted in a regrouping and redirection of the Laboratory's research. In recognition of the need to produce more fundamental knowledge for the solution of

immediate practical problems, as well as those of the future, effort will be directed towards increasing efficiency of capture and increasing knowledge of the biology of the tunas, identity of the stocks, and distribution and abundance of the Pacific-wide tuna resources.

Research leading to increased efficiency of capture will involve behavior studies at sea and of captive tuna held



Fig. 2 - A captive six-pound skipjack tuna swimming in tank at Honolulu Biological Laboratory. This is first time skipjack have been held in captivity for more than a few hours or have been induced to feed.

in ponds and tanks; evaluation of potential live-bait supplements, and evaluation and refinement of existing and the development of additional prediction techniques. Each of these studies is dependent, in part, on knowledge relating to the biology of the tuna; knowledge of their spawning, life history, growth, and size distribution--all of which will receive increased attention.

Although tagging experiments have yielded valuable information to the identity of tuna stocks as well as on migrations, they are expensive and limited to areas where there are fisheries. Studies of genetic characteristics and blood groups were initiated in May 1960. The presence or absence of specific genetic characteristics in fish from different areas indicates whether or not interbreeding occurs, and thus whether one or more distinct populations are involved.

In order to pursue studies of the Pacific-wide distribution and abundance of the tunas and of the variations in the dis-

tribution and abundance as related to the environment, all available tuna catch and oceanographic station data are being assembled. These data, as received and as necessary, will be transferred to punch cards. In some cases, duplicate decks of punch cards are available from other institutions. As the files become complete for particular areas, average yield figures per unit area, per unit time, and per unit of effort will be prepared. In addition, the average values for units of area and time for selected oceanographic features will be similarly prepared. Examination of both sets of data may be expected to reveal problems and to suggest relationships which will require more intensive study.

In addition various exploratory-theoretical studies are under way or planned. Through attempts to generalize and synthesize existing knowledge, it is hoped to push understanding beyond present levels, perhaps identifying critical observations or experiments to be made in the laboratory or at sea.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE
PURCHASES, JANUARY-APRIL 1960:
Fresh and Frozen Fishery Products:
For the use of the Armed Forces under

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, April 1960 with Comparisons

Quantity				Value			
April 1960	1959	Jan.-Apr. 1960	1959	April 1960	1959	Jan.-Apr. 1960	1959
1,646	2,188	16,894	17,137	958	982	3,688	3,782
.....(1,000 Lbs.).....				.....(\$1,000).....			

the Department of Defense, 1.6 million pounds (value \$958,000) of fresh and frozen fishery products were purchased in April 1960 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in March by 14.9 percent, and 24.8 percent under the amount purchased in April 1959. The value of the purchases in April 1960 was lower by 11.4 percent as compared with March and 2.4 percent less than for April 1959.

During the first four months of 1960 purchases totaled 6.9 million pounds (val-

ed at \$3.7 million)--a decrease of 3.4 percent in quantity and 2.5 percent in value as compared with the similar period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in April 1960 averaged 58.2 cents a pound, about 2.3 cents higher than the 55.9 cents paid in March and 13.3 cents more than the 44.9 cents paid during April 1959.

Canned Fishery Products: Purchases of canned fishery products were

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, April 1960 with Comparisons

Product	Quantity				Value			
	April		Jan.-Apr.		April		Jan.-Apr.	
	1960	1959	1960	1959	1960	1959	1960	1959
Tuna . . .	13	539	1,282	1,408	8	271	581	658
Salmon . .	-	-	-	-	-	-	-	-
Sardine . .	15	15	61	280	6	6	26	46
	(1,000 Lbs.)				(\$1,000)			

very light during April this year. In the first four months of 1960, purchases of canned tuna were lower by 9.1 percent and canned sardines were down about 78.2 percent as compared with the same period in 1959. No canned salmon was purchased during January-April 1959 and 1960.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Frozen Processed Fish and Shellfish Consumption

IN INSTITUTIONS AND PUBLIC EATING PLACES IN LOS ANGELES:

Information from restaurants and institutions concerning the consumption of frozen processed fish and shellfish was the objective of a survey in 10 major cities recently completed by Crossley S-D Surveys, Inc. for the Bureau of Commercial Fisheries. Los Angeles stands sixth among the ten cities surveyed in terms of percentage of all establishments buying frozen processed fishery products, and first in the variety of species purchased. Twenty-one species were included in Los Angeles purchases. Almost



three-fourths of all Los Angeles restaurants and institutions buy fish and shellfish, many of which buy them frozen. A breakdown of the types of frozen fishery products purchased during the survey month of November 1958 by the establishments that do serve those products showed that 36 percent was frozen processed fillets and steaks, 35 percent was frozen processed shellfish, and 20 percent was frozen portions, with the remainder unspecified varieties.

The incidence of use of frozen processed products was greater among institutions than among public eating places.

Among purchasers of frozen processed fish, more than a third bought halibut steak. This compares with 21 percent that purchased cod fillets; 20 percent halibut fillets; and 11 percent salmon steaks. Even though halibut fillets ranked third in choice, this item led the other four in poundage. In the shellfish category, one-third of the establishments using them bought frozen raw shrimp while almost the same number bought breaded shrimp. Raw scallops were another popular purchase.

Portions were a popular purchase with one-fifth of all the establishments in the city. This group preferred the fish uncooked whether breaded or plain, and Los Angeles ranked fourth among the ten cities in the percentage of establishments buying portions. Almost two-thirds of the purchasers of portions said they were currently buying about the same amount as a year before. Nineteen percent said

they purchased more than the previous year, while fewer than 8 percent said they bought less.

According to the survey, almost all establishments serving frozen processed fish, shellfish, and portions were satisfied with the preparation, quality, and condition of the products. With reference to portions only, one-fifth of the users felt that the quality of portions was better than that of other frozen processed fish; three-fourths rated the quality as about the same; 1 percent considered the quality poorer.

Major advantages cited for portions were:

	Percentage of <u>Users Citing</u>
"Time-saving"	49
"Convenience, ease of preparation"	36
"Economy, no waste"	30
"Uniform size"	22

Portions came under greater scrutiny than any other product. About one-third of users noted some disadvantage to using portions, yet 40 percent said their customers liked portions better than the processed fish. This is compared to 41 percent who claimed their customers liked portions about the same as processed fish and the 3 percent who said they liked portions less than other types.

Frying was the preferred method of preparing and serving fish among Los Angeles establishments. The average establishment served 53 percent of its fish fried, 24 percent broiled, and 18 percent baked.

In the shellfish category, the typical establishment served two-thirds of its shellfish fried, about 63 percent of its portions fried, while only 21 percent of portions was served baked. Four-fifths of the establishments using portions cooked them while frozen.

Portions received extra attention in this survey because of their growing acceptance in the restaurant and institutional trade. Of the establishments using portions, 15 percent said they were more expensive than other forms of frozen processed fish. A large majority of users considered them less expensive, or rated them about the same.

Five-sixths of the Los Angeles purchasers said they specified the kind of fish when ordering portions. Only 3 percent suggested new varieties of portions that were not then available. Establishments that did not use portions gave a number of reasons:

"They sold comparatively little fish"
 "They served other types of fish"
 "Portions were too expensive"

Establishments in Los Angeles tended to buy frozen processed fishery products from both frozen-food distributors and fishery wholesalers. Fifty-two percent of the suppliers were within 10 miles of the establishment, while another 45 percent were between 10 and 50 miles away. In almost half the cases, deliveries were made once a week, while one-fourth got delivery between 2 and 4 times a week, and most all were satisfied with the services of the suppliers.

Five-eighths of the profit-making establishments which expressed an opinion considered frozen processed fish and shellfish more profitable than other protein foods.

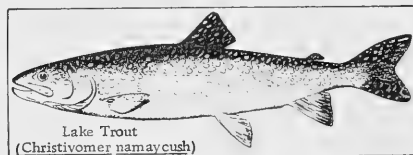
Note: See Commercial Fisheries Review, January 1960 p. 32.



Great Lakes

LAKE TROUT RESTOCKING PROGRAM:

Approximately 92,000 yearling lake trout were released in Lake Michigan



early in April by the Michigan Conservation Department and the U. S. Bureau of Sport Fisheries and Wildlife to kick off Michigan's first plantings for 1960 under the projected 10-year program to revitalize trout populations in the upper Great Lakes.

About 580,000 of the 1,260,000 yearling and fingerling lake trout slated for planting in Lakes Michigan and Superior during 1960 will come from Federal hatcheries in Michigan. Ontario will release another 470,600 lake trout while Wisconsin will stock the remaining 210,000.

In 1959, the State and Federal agencies pooled their resources, planting some 880,000 lake trout, to launch the rehabilitation program. The Great Lakes Fishery Commission has set an annual planting goal of 7 million yearling trout in Lakes Michigan, Huron, and Superior to restore populations which have been virtually wiped out by the sea lamprey.

This year's planting stock, consisting mainly of one-year-olds ranging from 5-6 inches, will be immune to the lamprey for several years after their release. By this time, it is expected that the predator will be under control.

The April plantings were made in the area of Fox, Trout, and South Fox islands in Lake Michigan with stock purchased by Illinois and reared at the U. S. Fish and Wildlife Service's Charlevoix Hatchery. An additional 37,000 fingerling lake trout from the hatchery will be liberated in Lake Michigan this fall as an experimental planting. Exact site of this release has not yet been determined.

Early in June, another 451,000 yearling lake trout will be set free in Lake Superior. This stock includes 292,000 trout reared at the Service's Pendills Creek hatchery from eggs collected in Crystal, Glen, Elk, Torch, and Higgins Lakes during the fall of 1958.

Of this total, 146,000 will be scattered from docksides or the shore at several sites within Keweenaw Bay; the other half will be released in the Bay between Baraga and Pequaming Point. The other 159,000 yearlings, reared from brood stock at the Michigan Conservation Department's Marquette Hatchery, will be planted off Laughing Fish Point in Shelter Bay.

All stock will be marked with fin clips by personnel from the U. S. Bureau of

Commercial Fisheries for identification purposes.



Great Lakes Fisheries Exploration and Gear Research

SURVEYS OF COMMERCIAL FISH STOCKS IN LAKE ERIE TO BE OBTAINED IN 1960:

Explorations to determine the commercial potential of fish stocks in the United States waters of Lake Erie are to be continued in 1960. The U. S. Bureau of Commercial Fisheries chartered fishing vessel *Active* was scheduled to start exploratory fishing about May 16. Cruise 9, the first of the 1960 season, was to cover Lake Erie waters between Sandusky and Avon Point, Ohio. The vessel was scheduled to visit the ports of Huron, Vermilion, and Lorain to demonstrate gear techniques to commercial fishermen.



Great Lakes Fishery Investigations

LAKE ERIE FISH POPULATION RESEARCH INDICATES SHORTAGE OF ADULT YELLOW PIKE:

M/V "George L.," April 1960: Field work in 1960 did not start until the ice went out in early April, according to a U. S. Bureau of Commercial Fisheries report on the Lake Erie Fishery Investigations. Unusually warm weather followed shortly thereafter and surface water temperatures rose from about 37° F. on April 13 to about 55° F. on April 28. Trawl catches indicated that most fish were in deeper waters.

Low commercial catches of large yellow pike in April strongly suggest a shortage of brood stock for spawning. This was expected, since only 37,000 pounds of yellow pike were taken in the Ohio commercial catches in the fall of 1959. The catch of yellow pike in the spring of 1960 is nearly certain to be a record low.

Many 9½- to 12-inch yellow pike were taken in trap nets in the Western Basin

in April. Approximately 4,000 of the fish were tagged in Ohio waters to determine the extent of movement to Canadian and other waters.

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PROGRAM OF THE RESEARCH VESSEL "CISCO" FOR 1960:

The possibility of an extensive trawl fishery for chubs in Lake Michigan in the very near future makes it imperative that an accurate estimate of the present chub population in the Lake be obtained, since it will be highly desirable to know what changes, if any, the prospective trawl fishery will bring about.



Cisco, research vessel of the Service's Great Lakes Fisheries Investigations.

The chief aim of the U. S. Bureau of Commercial Fisheries research vessel Cisco during 1960 and 1961, accordingly, will be to establish a basis for future comparisons of Lake Michigan chub populations. The study will be conducted in the southern part of the lake in 1960 and the northern part in 1961.

An attempt will be made to determine the present populations by use of both gill nets and trawls. The intent is to standardize gear and techniques so that current and future data will yield reliable estimates of population changes. Gangs of nylon gill nets, which contain 9 mesh sizes from 1 to 4 inches, stretched measure, were hung by the Cisco's crew in the interest of standardization. The standard trawl will be a commercial type now used by Lake Michigan chub fishermen.

In 1960 the nylon gill nets will be set periodically at 25 and 50 fathoms off Grand Haven and St. Joseph, Mich., and Racine, Wis., and at 80 fathoms in mid-

lake between Grand Haven and Racine. The trawls will be towed at various depths off these same ports and off Milwaukee, Wis., at regular time intervals. Emphasis will, of course, be on chubs, but data for other species will also be collected.

A second objective will be to compare present chub populations with those of 1954-55. The identical linen gill nets (several mesh sizes, 2 $\frac{3}{8}$ -3 inches) which were set by the Cisco in 1954 off Grand Haven, Mich., will be set in the same manner in 1960 off Grand Haven.

Another objective during 1960 will be to study the relationship of gill-net catches with the length of time set, as applied to chubs. This problem is, of course, complicated, probably related to abundance, species, and other variables, but any information at all would aid in analyzing gill-net catches.

Lack of time will limit limnological investigations to routine collections and observations, and perhaps a few brief special studies. The 11 cruises planned for the Cisco in 1960 will start on April 26, and end about December 6.

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RESEARCH VESSEL "SISCOWET" PROGRAM FOR 1960:

During 1960 the U. S. Bureau of Commercial Fisheries research vessel Siscowet will conduct its operations in western Lake Superior, with the exception of the Isle Royale survey. Attention will be devoted primarily to the study of the bathymetric distribution of fish stocks by fishing standard gangs of experimental gill nets (mesh sizes 1" to 5" by $\frac{1}{2}$ " intervals) at depths ranging from 10 to 70 fathoms.

Long-term observations of environmental conditions and fish populations will be continued. Measurements will be made at index stations established in 1958.

Surveys will also be devoted to (1) the study of chubs (*Leucichthys* sp.) and lake trout in the Isle Royale region and along the Canadian north shore; (2) the spawning grounds of the lake trout and whitefish in the Apostle Island area; and (3) the collection of chub eggs and new

methods of trawling to sample stocks of spawning lake herring.

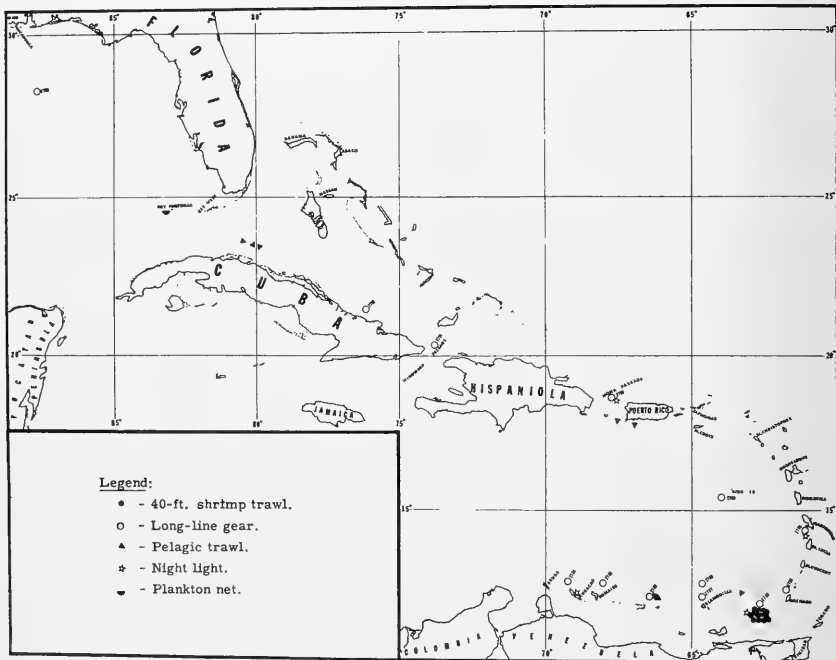


Gulf Exploratory Fishery Program

TUNA DISTRIBUTION IN SOUTH-EASTERN CARIBBEAN SEA AND OCCURRENCE OF ROYAL-RED SHRIMP OFF TRINIDAD EXPLORED:

M/V "Oregon" Cruise 66 (March 30-May 4, 1960): The objectives of the

Sta. No.	Yellowfin	Bluefin	Albacore	Blackfin	Skipjack
2764	-	-	2	-	-
2765	3	-	4	-	-
2766	7	-	-	-	-
2767	-	-	-	-	-
2768	8	-	-	-	2
2769	3	-	1	-	-
2783	10	-	-	-	-
2785	11	-	1	-	-
2786	3	-	-	-	-
2790	2	-	-	-	-
2791	-	5	2	2	3
2792	-	-	-	-	-
2796	3	9	-	-	-
Total	51	14	12	2	5



M/V Oregon Cruise 66 (March 30-May 4, 1960).

cruise were to determine species, distribution, and availability to long-line gear of pelagic tunas and other large pelagic fish in the southeastern Caribbean Sea and eastern Gulf of Mexico. Besides the U. S. Bureau of Commercial Fisheries exploratory personnel, biologists from the Woods Hole Oceanographic Institute and the American Museum of

Natural History also participated in the 36-day cruise to tag tuna and marlin and to obtain biological data on the tunas and other large pelagic fishes. Another objective was to further the Bureau's studies on the distribution of the deep-water royal-red shrimp between 61° and 66° west longitude.

During the cruise 13 long-line sets, averaging 50 baskets per set, were made (see cruise chart and tables 1 and 2). Twelve

Species	Total No.	No. Tagged	Weight (Lbs.)
Bluefin (Caribbean)	5	0	2,185
Bluefin (Gulf)	9	0	4,000
Total	14	0	6,185
Yellowfin (Caribbean)	48	12	5,745
Yellowfin (Gulf)	3	0	450
Total	51	12	6,195
Albacore (Caribbean)	12	1	563
Blackfin "	2	0	28
Skipjack "	5	0	105
Blue marlin "	6	1	1,250
White marlin "	8	0	680
Sailfish "	2	0	125
Spearfish "	2	0	121
Dolphin "	8	0	165
Rainbow runner "	1	0	8
Lancetfish "	2	0	13
Barracuda "	3	0	39
Sharks "	46	0	6,925
Sharks (Gulf)	10	0	1,550
Total	107	2	11,572
Grand Total	172	14	23,952

yellowfin tuna, one albacore, and one blue marlin were dart-tagged and re-leased. Stomach content analysis, sex determination, and spawning condition and morphometric data were obtained from the remainder of the catch. Plankton tows and pelagic fish trawl tows were made in widely scattered areas.

Thirteen exploratory drags were made northwest of Trinidad in 160-290 fathoms, using a 40-foot two-seam shrimp trawl. Generally poor trawling bottom was encountered in the area, which prohibited long drags. *Penaeopus megalops* and royal-red shrimp, *Hymenopenaeus robustus*, were encountered in small numbers throughout the depths covered. The largest catch contained 40 pounds of *megalops* and 10 pounds of *robustus* from a 50-minute drag.



King Crab

EASTERN BERING SEA OPERATIONS:

In April 1960, the eastern Bering Sea king crab stocks were being exploited by fishermen from three countries. United States fishermen with 7 fishing vessels were taking crabs by otter trawling. Also, the Japanese fleet was fishing with the mothership Токеи

Мару, 3 exploratory tangle-net vessels, and 8 "Kawasaki"-type fishing vessels. The Russian fleet was fishing tangle nets and was made up of the mothership Vsevolod Sibirzev No. 24, at least 2 exploratory tangle-net vessels, and 10 to 12 "Kawasaki"-type boats.

In view of the magnitude of fishing effort and the difference in fishing methods, gear conflicts occasionally occur. This is particularly true in the early spring due to the constricting influence on the fishing area by ice. Secondly, king crabs



King Crab

are not uniformly distributed, but occur in relatively few areas of concentration.

Since 1954, Japanese and United States fishermen have marked their fishing areas by buoys and daily they inform each other by radio contact of their area of operations. This procedure has worked out very well and no conflicts have occurred over fishing grounds. By agreement, no buoys are placed within five miles of the fishing grounds being occupied. The Japanese and United States fishermen hope to make such an agreement with Soviet fishermen operating in that area.

TAGS RETURNED BY U. S. S. R.:

The U. S. Bureau of Commercial Fisheries king crab investigations received 34 tags with recovery information from the Soviet Union. The recoveries were made by the Russian king crab fishing vessels between July 17 and September 12, 1959, and included tags released by the Bureau biologists in 1957, 1958, and 1959.

The positions from which these recoveries were made are of particular interest. They indicate that the Russian king crab fishery was centered approximately 120 miles due north of Unimak Pass. It is an area in which the Bureau's surveys have annually shown an abun-

dance of new-shell crabs. It has not been fished by the Japanese commercial fishery and in past years was a major fishing area for United States fishermen during the autumn months.



Maine Sardines

CANNED STOCKS, APRIL 1, 1960:

Distributors' stocks of Maine sardines totaled 252,000 actual cases on April 1, 1960--2,000 cases less than the 254,000 cases on hand April 1, 1959, according to estimates made by the U. S. Bureau of the Census.

Canners' stocks on April 1, 1960, totaled 397,000 standard cases (100 3½-oz. cans), a decrease of 77,000 cases (16.0 percent) as compared with April 1, 1959.

Type	Unit	1959/60 Season			1958/59 Season			
		4/1/60	1/1/60	11/1/59	7/1/59	6/1/59	4/1/59	11/1/58
Distributors	1,000 actual cases	252	235	296	176	197	254	312
Canners	1,000 std. cases ^{2/}	397	843	1,001	422	272	474	1,037

^{1/} Table represents marketing season from November 1-October 31.
^{2/} 100 3½-oz. cans equal one standard case.
 Note: See Commercial Fisheries Review, March 1960 p. 22. Correction in Table 1 the season heading "1957/58 Season" should read "1958/59 Season."

The 1959 pack (from the season which opened on April 15, 1959, and ended on December 1, 1959) was 1,753,000 standard cases, compared with 2,100,000 cases packed in the 1958 season. The 1960 fishery was legally open on April 15, but the canneries remained closed due to lack of fish.

The total supply (pack plus carryover on April 15, 1959) available during the 1959/60 season at the canners' level totaled 2,171,000 standard cases as compared to 2,434,000 cases the previous season. This was due to the decline in the amount packed in 1959/60. Canners' shipments from April 15, 1959, to April 1, 1960, amounted to 1,774,000 cases as compared to 1,960,000 cases for the same period a year earlier.



Michigan

COMMERCIAL FISHERMEN PROPOSE CHANGES IN FISHING REGULATIONS:

The commercial fishermen of Michigan appeared before the State's Conservation Commission in April 1960 and made an urgent appeal for quick adoption of their proposed liberal changes in regulations.

They told the Commission, which was given power to regulate Michigan's commercial fishing industry March 19, 1960, that the changes were necessary to save their businesses and put them on better competing terms with operators from other Great Lakes states.

Keynoting their appeal was a request for permission to use the otter trawl, a type of fishing gear new to Michigan's commercial fisheries.

The Great Lakes area Regional Director of the U. S. Bureau of Commercial Fisheries said it is very difficult for gill-net operators to make a living in Lake Michigan. He qualified this by saying present equipment is outmoded because it was primarily designed for catching fish that have virtually disappeared.

The Bureau's Regional Director pointed out that there still is good potential in the lakes for commercial fishermen and although trawling is an expensive operation, it is the only answer to saving the industry. He assured that trawling would not deplete game species because it allows for selective fishing.

The head of the Bureau's sea lamprey control program warned that the lamprey is now wasting the portion of chub populations which should be harvested by commercial oper-

tors. He remarked there is no biological reason for protecting these populations in deep waters, adding that the otter trawl provides a more efficient means of harvesting these stocks.

Trawl operators in other Great Lakes states are reportedly finding a ready market for small chubs and other non-commercial fish from companies producing pet food and fertilizer.

The President of the Michigan Fish Producers Association and spokesman for one group of fishermen, requested 10 changes in regulations. He proposed that the mesh size of chub nets be reduced by one-sixteenth of an inch and recommended lowering the size limit for yellow perch in a triangular area of Green Bay to match Wisconsin's 8-inch minimum.

Some of his other recommendations called for revising the season on yellow pickerel in Saginaw Bay to conform with the one in Lake Huron; switching the closed season on whitefish to November 1-December 10; extending the area where trap nets may be used for taking whitefish in Lake Huron; removing the closed season on calico bass; and matching sport and commercial perch fishing seasons in Lake Michigan.

Michigan's Department of Conservation officials told the fishermen that legal steps required by the Administrative Procedures Act in enacting legislative changes generally take about 90 days. Before action was taken on the above proposals, Department officials scheduled 10 meetings between May 3 and May 23 with commercial fishermen throughout the state to discuss problems.

* * * * *

COMMERCIAL FISHERMEN'S PROBLEMS DISCUSSED AT MEETINGS:

Michigan's commercial fishermen had an opportunity to present their problems and offer possible solutions to Conservation Department officials during a series of 10 meetings held throughout the State from May 3 through May 26, 1960.

From the meetings Department officials hoped to get the consensus of operators, which will lay the groundwork to managing the State's commercial fishing industry on a closer and more profitable basis than in recent years.

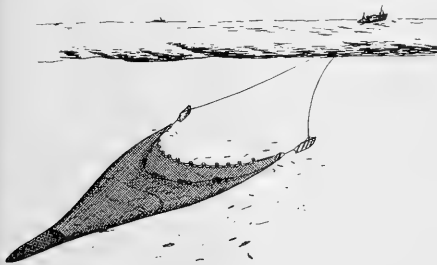
Regulation of this industry, involving about 1,000 licensed operators and some 39,000 square miles of Great Lakes waters, became the Conservation Commission's responsibility on March 19, 1960. Administrative duties have been assumed by the Department.

Under its new authority, the Commission is empowered to adjust regulations, pending legislative approval, with the exception of license fees and penalties. Regulations in effect before the transfer of authority have remained unchanged.

* * * * *

USE OF TRAWLS IN GREAT LAKES PROPOSED:

A proposed change in commercial fishing regulations to permit the use of



Atlantic otter trawler.

trawls in Michigan waters of the Great Lakes was discussed before the Conservation Commission during a special public hearing held on May 12, 1960, at the Higgins Lake Conservation School.

As proposed, the regulatory change would authorize the Conservation Department to issue permits for the use of trawls by commercial fishermen in taking chubs, herring, alewife, smelt, and other fish species it might designate. The Department would also regulate the kind and size of trawls, their mesh sizes, and the areas, time, and manner in which this new type, for the Great Lakes, of fishing gear could be used.

Permittees would be required to keep and submit records and reports of their trawling operations as required by the Department. Department authorities would be allowed to inspect these operations and check equipment, records, and fish catch.



Missouri

COMMERCIAL FISHERIES LANDINGS, 1959:

In 1959, Missouri's commercial fishermen landed fish valued at \$85,000, lower by about \$10,000 than in 1958, a Missouri Conservation Commission fisheries biologist stated.

Fishermen on the Mississippi River landed 178,974 pounds of fish, those on the Missouri River landed 154,359 pounds and those on the St. Francis River landed 25,413 pounds.

Out of 1,076 persons who bought commercial fishing permits in 1959, only a few made it a full-time occupation. The high cost of equipment has caused the number of commercial fishermen to decline the past 15 years, while others were squeezed out of business when people refused to buy fish that tasted "oily" from pollution near the big cities.

"Actually there's a big demand for fresh river fish," the biologist said, "and the 358,746 pounds taken last year by commercial fishermen was only a small part of what was sold. Fish dealers import millions of pounds of marine and fresh-water fish yearly from outside Missouri to fill the demand."

Carp accounted for 41 percent of the catch, followed by buffalofish, flathead

catfish, drums, blue catfish, paddlefish, channel catfish, gar, sturgeon, suckers, bowfin, eels, and bullheads, in that order.



National Fisheries Institute

RESOLUTIONS ADOPTED AT 15TH ANNUAL CONVENTION:

At the National Fisheries Institute 15th Annual Convention in Miami Beach, April 29-May 4, nine resolutions were submitted and adopted by the Board of Directors on May 4, 1960.

1. **Voluntary Frozen Food Handling Practices.** That the Association of Food and Drug Officials of the United States be commended for its interest in the improvement in the handling of frozen foods; but that the Institute vigorously insists that improvement in frozen food handling methods can be accomplished better by cooperative industry action than by State, Federal, or Municipal Government statutory or regulatory actions; and that the Institute join with other segments of the frozen food industry in developing and adopting a uniform industry program of frozen food handling practices; and that the Institute through its membership urge state legislators and agency officials to refrain from establishing arbitrary and unrealistic laws or regulations in the realm of quality improvement of frozen seafoods.

2. **N. F. I. to Participate in Joint Frozen Food Committee.** Whereas, it is desirable for the Institute to join with other segments of the frozen food industry in properly developing such a program; and whereas, members of the Institute and the staff have already constructively participated in preliminary joint industry meetings; it was resolved that the President be directed to appoint a committee of three members to direct and guide this program; and that said committee and the staff be given authority to represent the Institute in any joint industry committee and to participate in the development of the program; and that the Executive Committee be empowered to solicit voluntary contributions of such funds as may be required to carry out this resolution.

3. **Fresh-Fish Handling Research.** The Institute requests the U. S. Bureau of Commercial Fisheries to continue its technological investigations of fresh-fish handling methods and to initiate a comprehensive research on the relations of time and temperature to the losses of quality in each step in the handling of fish from the water to the consumer; and that the Institute's Technology Division staff be asked to carry out an active program of informing the fresh fish industry of quality-improving equipment and methods, through personal contacts and demonstrations, and through a monthly technical newsletter devoted specifically to fresh-fish handling matters, within budget limitations.

4. **Revise Frozen Fried Fish Sticks Standards.** The Institute requests the U. S. Bureau of Commercial Fisheries to study the advisability of revising the Standards for Grades of Frozen Fried Fish Sticks, and if the studies so indicate, to endeavor through research and frequent consultation with industry to develop an acceptable practical set of proposed revised Standards.

5. Authorizes Institute's Technology Division to accept specially contributed funds and regularly budgeted money, and to expend these in accordance with the contributing groups' instructions and within the Institute's regular operating limitations.

6. Authorizes Institute's Technology Staff members to participate in Atlantic and Pacific Fisheries Technological Conferences.

7. **Recommend Standards of Identity for Breaded Shrimp.** Whereas, the breaded shrimp industry has for two years considered the desirability of establishing Standards of Identity for Breaded Shrimp in order to prevent the possibilities of unfair competition from excessively breaded products; and whereas, the breaded shrimp industry has developed a set of possible standards which it plans to submit to the Food and Drug Administration for the latter's approval and official establishment; the Institute commends the breaded

shrimp industry for this action and urges the Food and Drug Administration to adopt the industry's proposed standard of identity for breaded shrimp.

8. **Retention of Fisheries Exemption for Truck Transportation.** The Institute reaffirms its support of the exemption from I. C. C. regulation of motor vehicles transporting fresh and frozen fishery products in interstate and foreign commerce.

9. **Regulated Motor Carriers to Publish Reasonable Rates and be Liable for Damages.** Whereas, Senate bill S. 3389 has been introduced in the 86th Congress of the U. S. requiring motor carriers to publish just and reasonable rates and making them liable for the payment of damages and reparation for failure to do so; and whereas, the fishery industry is in favor of the provisions of this legislation; the Institute supports the passage of S. 3389 or similar legislation which may be introduced in the future.



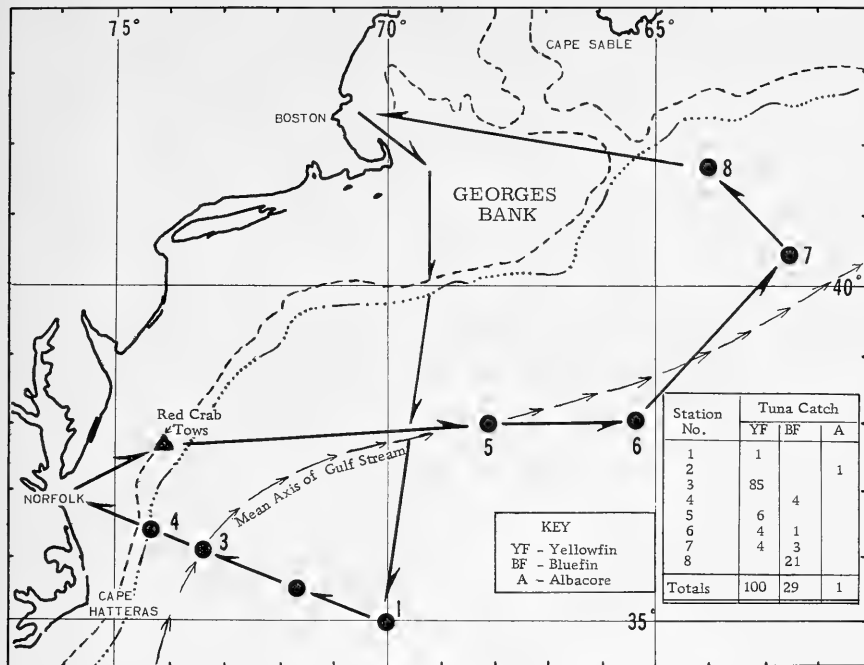
North Atlantic Fisheries Exploration and Gear Research

AREA BETWEEN GEORGES BANK AND CAPE HATTERAS EXPLORED FOR TUNA STOCKS:

M/V "Delaware" Cruise 60-6: Tuna were landed at each of eight long-line stations completed by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware during an April 18-May 7 cruise. Three species--bluefin (Thunnus thynnus), yellowfin (Thunnus albacares), and albacore (Thunnus alalunga)-- were present in the catch taken from the waters between Cape Hatteras and Georges Bank.

During the cruise, a variety of hydrographic conditions were encountered, with surface temperatures at long-line fishing locations ranging from 43.6° to 77.1° F. Some of the fishing stations were either in, or directly adjacent to, the axis of the Gulf Stream. Catches at the stations with high water temperatures were predominantly yellowfin, while catches at locations with colder water were bluefin; intermediate locations produced mixed catches of both species.

The most productive station was located in the Gulf Stream Track at 73°25' W. longitude and 36°07' N. latitude, and yielded 85 yellowfin on a 60-basket set (600 hooks). The estimated weight of the fish caught at that station ranged from 70 to 90 pounds each. Water temperature at the surface was 77.1° F.

M/V Delaware Cruise 60-6 (April 18-May 6, 1960).

In addition to the information gathered on the distribution of certain of the tunas in the Western North Atlantic, biological and other data were collected by representatives of the Woods Hole Oceanographic Institution and Boston University. Forty-two tunas were marked and released, using plastic "spaghetti" tags.

During the cruise, two trawl stations were completed, in depths of 215 to 325 fathoms off Ocean City, Md. The objective of these tows was to collect a sample of the deep-sea red crab (*Geryon* sp.) for testing by the Bureau's Technological Laboratory in Gloucester. A total of three hours of trawling with a No. 36 trawl produced about 500 pounds of red crabs; these were cooked and frozen aboard the Delaware. In addition to the red crab catch, one of the tows yielded 21 American lobsters (*Homarus americanus*) which averaged six pounds each. Fish in these tows included several spe-

cies of hakes, some of which were preserved for study.

Notes: Also see Commercial Fisheries Review, July 1959 p. 40.

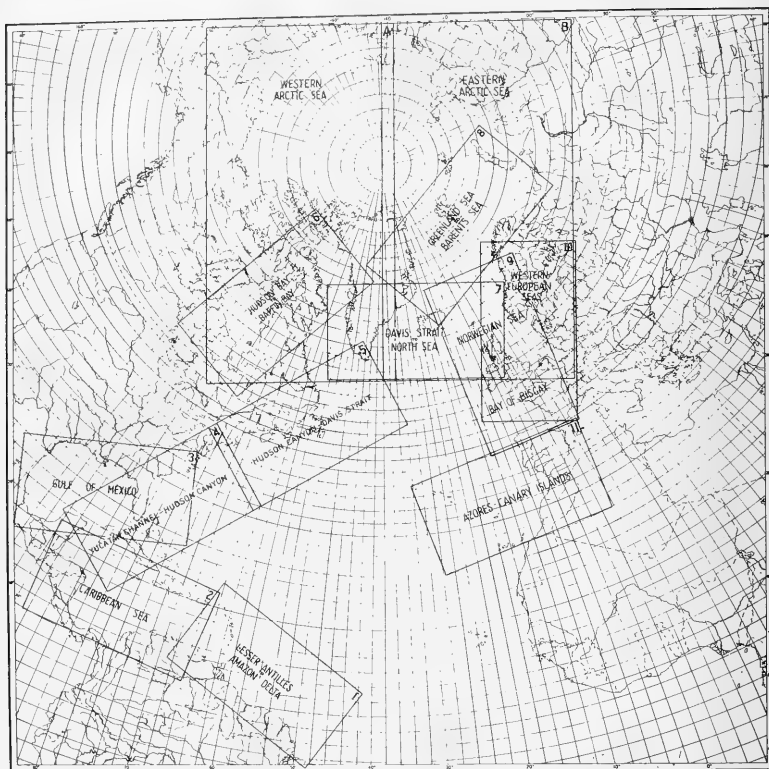


Oceanography

ATLANTIC OCEAN ATLAS BEGUN:

To chart the possibility of farming and mining the oceans for new sources of food, fuel, and minerals, the American Geographical Society has begun work on a comprehensive atlas of the North Atlantic Ocean. It is expected to provide scientists with a new research tool for making comparative studies of the interrelationships of marine organisms and their environments.

The project is aimed at integrating vast amounts of data, published and unpublished, now accumulating at a rapid rate. Physical oceanographers, marine biologists, geologists, physicists, and other specialists will be invited to contribute to the new atlas. They will be asked to plot their own original data on base maps specially prepared by the Society as work sheets. Where necessary, explanatory texts will supplement the maps, which



will be published individually in a continuing series as soon as they are completed.

The maps will be printed in two versions: one on paper, for general distribution; the other, a limited edition on transparent material, to facilitate comparative studies in research laboratories.

The biogeographical atlas will show as many of the variables of the ocean as possible. Embracing the North Atlantic from top to bottom and from the equator to the pole, it will show the distribution and productivity of plants and animals, bathymetry, bottom sediments, properties of water masses, courses of currents, seasonal changes in temperature, movement of water, direction and force of winds, air temperature, and solar radiation. The project is long-term in character and scientists expect substantial results by 1970.

Cooperating research organizations include the Atlantic Fishery Oceanographic Research Laboratory (U. S. Bureau of Commercial Fisheries), Woods Hole Oceanographic Institution, and the Royal Soci-

ety of Canada. Other scientific bodies and individual scientists on both sides of the Atlantic are being invited to cooperate in the atlas program. The American Geographical Society is serving as general coordinator and publisher.

The first maps to be published will be those of the continental shelf of eastern North America showing fishing activities and the distribution and biological productivity of plants and animals. Two sheets covering the eastern seaboard from the Labrador Sea to the Straits of Florida already have been completed.

The project is under the general auspices of the Committee on Oceanography of the National Academy of Sciences - National Research Council.

The Committee last year set up a Panel on North Atlantic Biogeography to investigate the feasibility of the present project. In a statement to the scientific press, one panel member said: "It happens often in marine research, as elsewhere, that correlations are found which seem significant, only to

have the pattern fall apart in a few years owing to the unsuspected existence of variables which had not been included in the original investigation. Plotting the distribution of as many variables as possible will offer a broader approach to these problems, and will uncover sensitive areas into which new research effort may be put." He said the new atlas would also offer means of publishing material which might not appear in print because of prior demands on research facilities.

It is hoped that most of the financing for the program will come from industry and foundations. Contributions totaling \$17,000 already have been made. A total of \$42,000 is being sought for the preliminary phase of operations. Cost of the project as a whole is estimated at \$500,000.

In Canada, the program is being sponsored by the Canadian National Research Council. European countries are being approached through the International Commission for the Northwest Atlantic Fisheries.

In describing the plan of operation, Dr. Hitchcock said that the completed work sheets returned to the panel by scientists would be evaluated. Once accepted, the materials would be sent to the Society, whose cartographers and technicians would study the best means of graphic presentation. Printing and distribution will be in charge of the Society.

The maps will necessarily vary in scale and in area covered, from a small section of the coast to an entire ocean, but they will all be based on a single oblique stereographic projection so computed that half-degree intersections of parallels of latitudes and meridians of longitude can be accurately plotted on whatever scale is chosen for an individual map.

Thus complete cartographic continuity for the whole area will be provided, and this continuity, valuable in itself, will solve the problem of joining adjacent sheets. It will also facilitate the reduction of large-scale compilations to smaller scales for such purposes as integrating and summarizing important results and conclusions.

The stereographic projection has the property of conformality (directions around points are shown correctly), which is important in plotting movement, as for example, flow lines of currents and migrations of fishes. Though precise measures of distances and areas cannot be recovered directly from a conformal map, simple procedures are available for obtaining these measures with sufficient approximation. In case such measurements are required, we plan to issue short instructions with the base charts.

While excellent marine atlases exist--principally in Russia, the Netherlands, Great Britain, France, and Japan--these do not serve the research needs envisioned. They are generally based on outdated published information, are too limited in scope, too generalized, and of too small a scale to be useful "for the purposes of integrating advanced research relating to marine environments and the problems of biogeography."

* * * * *

EXPEDITIONS BY THE SCRIPPS INSTITUTE OF OCEANOGRAPHY FOR 1960:

Scripps Institution of Oceanography expeditions planned in 1960 include:

Tethys Expedition: To cross the Equator and travel to five degrees south before making port in Honolulu. The expedition has two principal objectives. The first is to take samples of the small creatures of the oceans that live at a depth of about two miles. The distribution of these will be compared with that of near-surface animals, which are better known. In addition, geological studies will be conducted south of Hawaii. The expedition left its California home port in May.

Limbo Expedition. Takes the research vessel *Horizon* to a point about halfway between California and Hawaii to remain for several weeks measuring currents in waters three miles deep. This vessel also sailed in May.

Monsoon Expedition: Will use a 1,900-ton Navy ARS which is being reconditioned for oceanographic exploration. The ship will sail in August to cross the Pacific and Indian Oceans to Mauritius. After Mauritius she will visit Indonesia and Australia before returning to San Diego. The chief purposes of the trip are sediment studies in tropical waters and geological-geophysical investigations in the Indian Ocean. The Indian Ocean work is part of an International Oceanographic investigation of the area.

For three months, starting September 15, the R/V *Horizon* will engage in studies of the Peru Current, traveling as far south as northern Chile.

* * * * *

LINK ADDED TO UNDERWATER MOUNTAIN CHAIN IN GULF OF ALASKA:

A Coast and Geodetic Survey ship detected an unusual hump on the ocean floor in the Gulf of Alaska this year. The unusual hump turned out to be an 8,700-foot seamount or underwater mountain.

The discovery, announced on May 20, 1960, by the Director of the Coast and Geodetic Survey, U. S. Department of

Commerce, was first reported by the Captain of the Survey Ship Pathfinder after deliberately sailing her through an uncharted spot in a chain of charted underwater mountains marking an ancient fissure on the ocean floor.

When the sweep of the echo-sounder revealed the telltale rise in the ocean floor, the Pathfinder reversed her course and criss-crossed the area in question. After further processing of the soundings, hydrographers had an almost complete picture of the seamount which is a flat-topped cone that measures 12 miles in diameter at the base, $1\frac{1}{4}$ miles across the top, and 8,700 feet high. The almost perfect flat top, which is 3,984 feet under water, is marred by a slight peak in the center.

Although other seamounts of more than two miles high have been found in this region, the new discovery, located 56 degrees north latitude and 143.2 degrees west longitude, forms a significant link in a chain stretching southeastward across the Gulf of Alaska from Kodiak Island toward Vancouver Island. This is the 20th one to be located in the 600-mile chain, which begins on the floor of the Aleutian Trench 100 miles east of Kodiak Island, and it lies about one-third of the distance from Kodiak to Vancouver.

The new seamount is approximately the 160th discovered in this extensive Northeast Pacific region by the Coast and Geodetic Survey ships on their spring and fall trips to and from coastal survey areas in western and northern Alaska, the Aleutians, and in Bering Sea waters.

In addition to the seamount information, the deep-sea sounding lines provide a continuous track of soundings which are the basis of the Gulf of Alaska Nautical Chart No. 8500, originally published in 1952. The current issue of the chart includes numerous seamounts discovered and surveyed in detail to date.

Of interest are two falsely reported seamounts in the area of this chart, one of which was said to have been the cause of a serious shipwreck. When the Washington Mail broke in half in rough seas on March 3, 1956, 300 miles southeast of Kodiak Island, it was claimed that a sea-

mount caused the wreck. Pursuant to this claim the Coast and Geodetic Survey ship Pathfinder sounded a 1,000-square mile area at the reported position, but found no depths less than two miles deep.

Another pseudo seamount was reported to rise $1\frac{1}{2}$ miles to a depth of 70 feet, 75 miles off Vancouver Island, but repeated sounding over a large area indicates that the original reporting may have been caused by acoustic sounding-echoes from the back of a whale.

Although considerable exploration has been accomplished in this vast region of one million square miles, a great amount of surveying and oceanographic exploration is required to fully disclose the nature of this ocean floor so closely related to the continental United States.



Salmon

NEW SALMON FISH HATCHERY UNDER CONSTRUCTION IN STATE OF WASHINGTON:

Construction of a new salmon hatchery on Grays River, Pacific County, Wash., was announced by the Governor on May 5, 1960. The hatchery, with an annual fry capacity of around 7 million salmon and a rearing capacity of 5 million, will be the 22nd in the state's system of salmon hatcheries and the 5th built by Federal funds under the Lower Columbia River Development Program, the Governor said. Cost of construction will be over \$500,000.

Plans and specifications for the new hatchery, which were due to be completed on May 6 by the engineering section of the Washington State Department of Fisheries, were sent to Portland, Ore., for approval by the U. S. Fish and Wildlife Service, and finally to the Service's head office in Washington, D. C.

The job will include construction of a hatchery building, 100 by 40 feet, 10 outdoor concrete ponds, a large earthen pond, and two holding ponds for ripening salmon. A fish ladder, racks, and trap will be included for the holding ponds. In addition, a new timber bridge for access to the hatchery site will be constructed to

replace the present bridge. Water for the hatchery will be taken from the river with a gravity water supply system.

The hatchery will be used for the rearing of chinook, silver, and chum salmon, with special emphasis on the short-term rearing of chinook and chum.

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WASHINGTON AND OREGON COOPERATE IN SALMON TAGGING PROGRAM:

Salmon were tagged in the Possession Point area in Puget Sound in April by the Washington State Department of Fisheries, marking the third salmon research project carried out by the Department in March and April.

The Possession Point project includes a testing of the effects of single and treble hooks on young salmon. Salmon are caught on sports fishing gear and tagged under the dorsal fin with orange spaghetti-type tags. Recoveries will indicate which type of hook causes the most damage to the fish in addition to adding knowledge of migration patterns.

An offshore troll salmon tagging project was conducted off the coast south of Westport, Wash., from March 15 through April 9. Chinook salmon were tagged in an effort to establish migration patterns and the origin of chinook in the ocean area from North Head north to Grays Harbor. A total of 149 chinook was captured and tagged. Approximately 10 fish were taken each day of fishing. A similar project in 1959 averaged 8 fish per day. During March, best fishing was in the North Head-Willapa Bay area; in early April, fishing picked up slightly in the Westport area. Less than 25 percent of the chinook caught in the 1960 test were under the minimum legal size of 26 inches.

The Oregon Fish Commission also conducted an offshore troll tagging project in conjunction with the Washington Department of Fisheries. The Oregon project resulted in the tagging of 194 chinook. Both investigations included the use of barbed and barbless hooks and preliminary results indicated very little difference in catchability between the two.

The third project conducted by the Washington fisheries agency was a test-fishing investigation on chinook salmon in the Corbett drift area of the Columbia River, in an effort to determine timing of the spring chinook salmon run in the Columbia. This project closed on April 29, just prior to the opening of the spring Columbia River commercial chinook salmon fishing season.

The Columbia River test fishing project was also in conjunction with one conducted by the Oregon Fish Commission in Woody Island area where the fish caught in good condition were tagged and released. The biologists found that it takes approximately 12 days for a chinook salmon to move upstream to the Corbett area from the Woody Island area, a distance of approximately 65 miles.



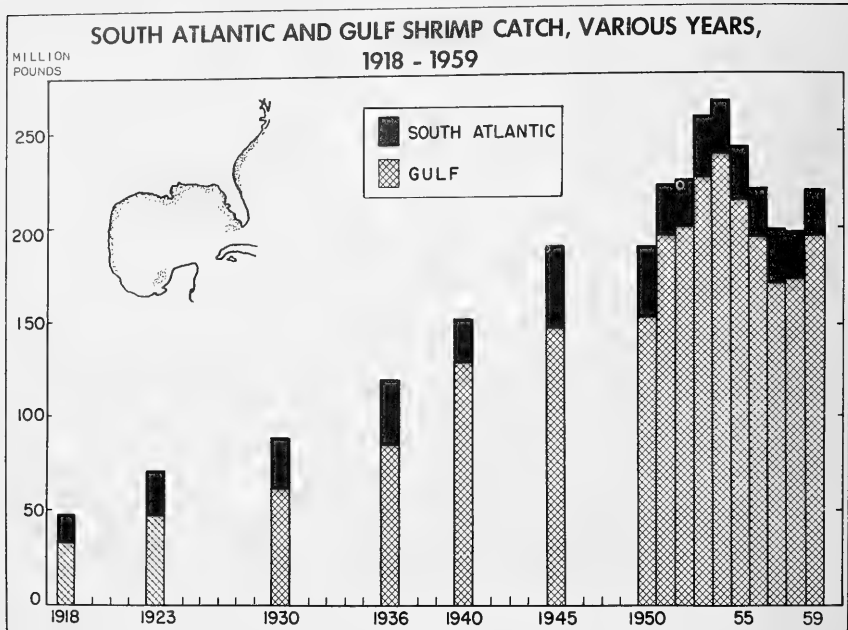
Shrimp

INDUSTRY CONFRONTED WITH PRODUCTION PROBLEMS:

An increasing number of craft sharing a fairly stable domestic shrimp resource and increasing domestic competition from shrimp fisheries developing in many parts of the world are among the problems facing the United States shrimp industry, according to a report issued by the U. S. Bureau of Commercial Fisheries.

The report was prepared in accordance with a provision of the Fish and Wildlife Act of 1956. This provision authorizes the Secretary of the Interior to make a report--when requested--with respect to any fishery product imported into the United States; to determine whether there have been any downward trends in prices, production, or employment; and to determine whether there has been an increase in imports of that product. The request was made by the National Shrimp Congress, Inc., an organization whose members produce more than 70 percent of United States-caught shrimp.

In releasing the report, Under Secretary Elmer F. Bennett said that it is not purported to be a complete economic



study of the shrimp fishery. "It would have been desirable to have made a more thorough economic study of the industry, but neither time nor resources would permit such detailed effort," he said.

"Accurately projecting the course of world production and expansion of exports of shrimp by foreign nations will require more information than is available in this report," Bennett said. "For these reasons any policy decisions of this Department, particularly with respect to tariff policy, should be based upon additional data and more complete analysis."

The report shows that in recent years there has been an increase in the number of shrimp boats, but no change in production other than the normal annual fluctuations in the resource; there has been a decrease in the gross earnings per boat; the discovery of new shrimp areas has resulted in the construction of more seaworthy larger vessels; in-

creased construction costs are noted; employment has increased at a greater rate than the increase in the number of vessels, mainly because the larger vessels require larger crews; and there has been a substantial increase in the amount of shrimp imported into the country.

One of the significant things noted in the report is that until the price to the shrimp fisherman dropped in 1959 there had been sufficient increase in prices to more or less balance off the decreasing catch per boat. Also, price decreases, boatside, before 1959 had been followed quickly by price increases which tended to stabilize the fishery. The 1959 slump presents a different picture and, the report says, "the effectiveness of the United States shrimp industry in coping with the present situation appears to be reduced."

In 1959 the average gross return for shrimp landings in the Gulf of Mexico and in the South Atlantic areas was \$7,500

per shrimp trawler, lower than any year since 1950 when it was \$6,400. The average annual catch for 1959 was 17,300 pounds (heads-off weight) per vessel. This was considered low, although it was 1,300 pounds more than the 1958 average. In 1953 the catch per trawler averaged 23,600 pounds.

During the past 10 years the shrimp otter-trawl fleet has increased by about 1,000 craft to a fleet of 7,610 in 1959. The increase was entirely in vessels of five tons net or over; the number of smaller craft of less than five net tons declined. More than 80 percent of the catch was taken by vessels of five net tons and over.

Employment in 1959 was estimated to have been slightly higher than in 1958 when it was 17,153, about 2,000 higher than in 1957. Comparable data for other years are not available.

In 1959 imports were at a record high of 106,555,000 pounds, an increase of 25 percent over the 1958 imports. The 1958 imports were 23 percent higher than those of 1957. In 1939 shrimp imports were four million pounds; in 1950 imports exceeded 40 million pounds and in 1955 shrimp imports approximated 54 million pounds.

Since 1948 the world production of shrimp, exclusive of mainland China, has increased nearly 80 percent, to reach an estimated 632 million pounds, heads-off weight. In 1950, 18 countries exported 40 million pounds of shrimp to the United States. Mexico supplied 99 percent of that. In 1959 there were 51 nations sending more than 106 million pounds of shrimp to the United States. Mexico led with 69 million pounds which represented 64 percent of the total.



South Atlantic Exploratory Fishery Program

LARGE BEDS OF CALICO SCALLOPS
FOUND OFF FLORIDA EAST COAST:
M/V "Silver Bay" Cruise 23 (April 13
to May 6, 1960): A large stock of calico

scallops (*Pecten gibbus*), occupying an extensive area, was discovered and tentatively delineated along the east coast of Florida near Cape Canaveral by the U. S. Bureau of Commercial Fisheries' chartered fishing vessel *Silver Bay* during an April 13 to May 6, 1960, exploratory cruise. Commercial concentrations were found over a 1,200-square-mile area with indications that the bed may be even more extensive.

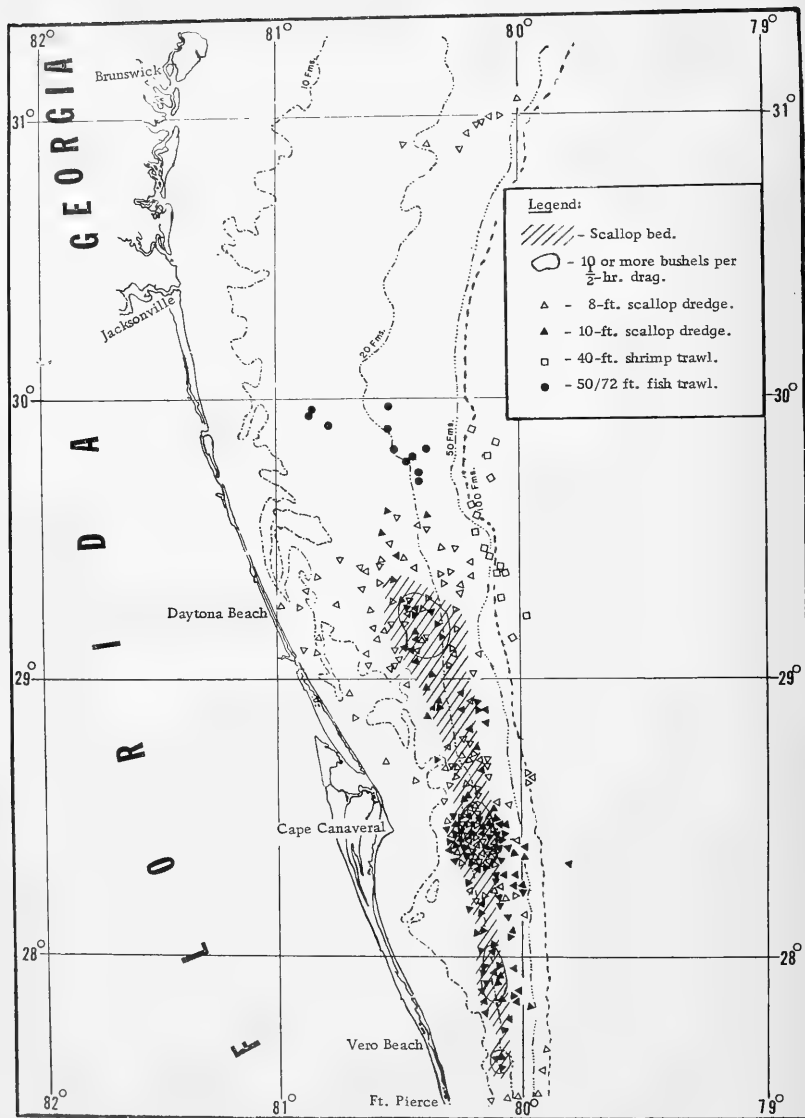
First indications of the resource were noted in January 1960 during routine explorations by the *Silver Bay* (Cruise 21) off Daytona Beach, Fla., when what now appears to be the northern edge of the bed was discovered. Heavy seas prevented further exploration at that time. As a result of the latest work the bed is now known to extend from off Daytona Beach to Ft. Pierce, Fla., in depths of 10 to 32 fathoms.

A total of 252 dredging stations was made during the cruise using 8- and 10-foot modified Georges Bank scallop dredges with 2" rings and 1½" mesh liners. A total of 177 drags within the confines of the bed yielded approximately 664 bushels of scallops (an average of 3¾ bushels per half-hour tow), and 126 of these drags were within the apparent areas of heaviest concentration (15 to 25 fathoms) and accounted for 659 bushels of the catch (average of 5.2 bushels per tow).

Within the most productive area (15-25 fathoms), 16 consecutive drags were made along the 20-fathom curve and yielded 135 bushels at rates of 1 to 13 bushels, averaging 8.5 bushels per day. Elsewhere the catch rates varied considerably on adjacent drags yielding from less than one to a high of 24 bushels per half hour.

The catch was predominantly within a shell size range of 2-2½ inches, yielding 4 to 5 pints of meats per 80-pound bushel. A 40-bushel sample of scallops of varying sizes were shucked for laboratory studies by Bureau Technologists.

Fifteen drags with a 41' head/47' foot rope, 1½" mesh, 2-seam shrimp trawl were made as a seasonal check on the royal-red shrimp potential off St. Augustine and

M/V Silver Bay Cruise 23 (April 12-May 6, 1960).

Daytona Beach. Catches up to 170 pounds (heads-on) per three hour drag were made in 180 to 230 fathoms between 29° 53' and 29° 09' north latitude.

Limited exploration on known snapper lumps off St. Augustine with a roller-rigged, 2-seam, 4½" mesh nylon fish trawl produced catches of mixed fish up to 1,500 pounds per 90-minute tow. Individual catches as high as 1,000 pounds of vermilion snappers (*Rhomboplites aurorubens*) and 345 pounds of porgies (*Pagrus* and *Stenotomus*) were made. No red snappers were taken.

Notes: Also see Commercial Fisheries Review, March 1960 p. 26.

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USE OF COMMERCIAL SCALLOP DREDGES DEMONSTRATED TO FISHERMEN:

During the week of May 30 to June 5 the Silver Bay conducted daily trips to the Cape Canaveral scallop bed off the Florida Atlantic Coast to demonstrate use of commercial scallop dredges to interested fishermen.

The M/V Silver Bay (Cruise 24) was scheduled to return to the Cape Canaveral, Fla., area during May 25-June 17 to conduct follow-up explorations and gear trials in the calico scallop bed discovered during cruise 23.



Tuna

UNITED STATES AND JAPANESE BIOLOGISTS COORDINATE RESEARCH ON ALBACORE SPAWNING AREAS:

The Director of the Hawaii Area and the Chief, Albacore Ecology Investigations, Honolulu Biological Laboratory, U. S. Bureau of Commercial Fisheries,

returned to Honolulu May 15, 1960, after spending a month conferring with various fishery officials and scientists throughout Japan.

Their trip was made primarily to plan an expedition to discover albacore spawning grounds, to be carried out this summer by the Bureau's research vessel Charles H. Gilbert and the Japanese Fishery Agency's vessel Shunyo Maru, attached to the Nankai Regional Fisheries Research Laboratory at Kochi, Japan. Biologists of the Honolulu Biological Laboratory and the Nankai Laboratory are both interested in learning the origin of this commercially-important Pacific-wide species of tuna. As a result of this trip, future research by Japanese and American tuna biologists will be more closely coordinated.



United States Consumption of Fishery Products, 1959

Fish is not keeping pace with the increased consumption trend for meats and poultry. There has been a sizable per capita consumption increase for meats and poultry, while fish and shellfish consumption is either barely holding its own, or declining.

Per capita meat consumption has increased steadily since 1935-39, with the exception of a decline in 1958 and a predicted minor decline in 1960.

Per capita poultry consumption has also shown a sharp increase since 1935-39, with a tendency toward stabilization since 1957. The greatest surge in consumption was during the 10-year period following 1947 when high volume production and a low selling price became the keynote of that industry.

Conversely, per capita fish and shellfish consumption reached its peak during 1935-39. But it dropped steadily from 1939 until 1958. In 1958 consumption recovered a little and the trend toward stability set in. Less canned and somewhat less cured fish were consumed in 1959 than during 1935-39, and fresh and frozen fish consumption increased only three-tenths of a pound (edible weight) per capita in the same period. The decrease in the consumption of canned fish was caused by a drop in the pack of canned salmon; also a shift in consumer preference from canned to frozen fillets and frozen packaged specialties like fish sticks and portions. Because cured fish is a more selective item and

Commodity	Average		1957	1958	Preliminary 1/		1960 as a Percentage of		
	1935-39	1947-49			1959	1960	1935-39	1947-49	1959
	(Pounds)				(Percent)				
Fish (edible weight) - Total	11.0	10.5	10.1	10.7	10.7	10.6	96	101	99
Fresh and frozen	5.4	6.0	5.6	5.9	5.9	NA	-	-	-
Canned 2/	4.9	3.9	3.9	4.2	4.2	NA	-	-	-
Cured	0.7	0.6	0.6	0.6	0.6	NA	-	-	-

1/ Excludes Hawaii and Alaska.
2/ Excludes canned food products containing small quantities of fishery products, such as clam chowder, etc.
NA: not available.

more stable, there has been no significant change in per capita consumption since 1947.

On the whole, however, the picture is not bright for edible fishery products as the major competitive products appear to be getting an ever-increasing share of per capita consumption, and likewise the consumer dollar.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, MARCH 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during March 1960 increased by 27.7 percent in quantity and 17.6 percent in value as compared with February 1960. The increase was due primarily to higher imports of groundfish and other fillets (up 1.5 million pounds), frozen albacore and other tuna (up 7.1 million pounds), and to a lesser degree, an increase in the imports of canned tuna in brine. The increase was partly offset by a 1.4-million-pound decrease in the imports of canned salmon.

Compared with March 1959, the imports in March this year were lower by 4.6 percent in quantity and 0.8 percent in value due to decreases in the imports of frozen tuna other than albacore (down 9.2 million pounds), and canned salmon (down 5.8 million pounds). Compensating, in part, for the decrease was an increase of about 6.3 million pounds in the import of frozen albacore tuna and groundfish and other fillets (up 1.6 million pounds).

Item	Quantity			Value		
	March 1960	Year 1959	1959	March 1960	Year 1959	1959
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish:						
Fresh, frozen & processed ^{1/}	80.2	84.1	1,070.5	24.1	24.3	309.6
Exports:						
Fish & shellfish:						
Processed only ^{1/} (excluding fresh & frozen)	3.5	7.7	68.0	0.9	2.1	25.2

United States exports of processed fish and shellfish in March 1960 were lower by 34.5 percent in quantity and 30.8 percent in value as compared with Feb-

ruary 1960. Compared with the same month in 1959, the exports this March were lower by 55.1 percent in quantity and 57.1 percent in value. The lower exports in March this year as compared with the same month in 1959 were due to the short supply of California sardines available for export to foreign countries.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the 12½-percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-April 30, 1960, amounted to 13,516,144 pounds, according to data compiled by the Bureau of Customs. From January 1-May 2, 1959, a total of 14,958,862 pounds had been imported.

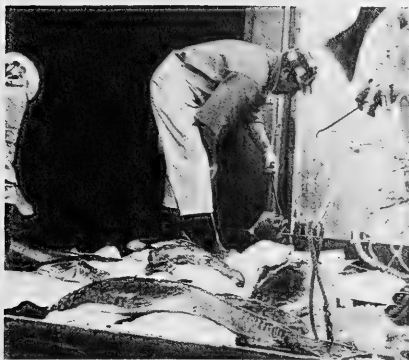


Wholesale Prices, May 1960

The over-all wholesale price index for edible fishery products (fresh frozen and canned) for May 1960 was 126.8 percent of the 1947-49 average, up 2.7 percent from the preceding month. This increase from April to May was due primarily to higher fresh haddock and fresh and frozen shrimp prices. From May a year ago to this May the index increased 4.0 percent due mainly to higher prices for shucked oysters, frozen shrimp, and canned fish. The May 1960 index was the highest since March 1959 when it reached 128.2 percent.

With haddock landings at New England ports falling off seasonally from the peak catches of March and April, the ex-vessel price at Boston went up 50 percent from April to May. This sharp price increase plus a further increase in the frozen king salmon price resulted in a 4.0-percent rise in the drawn, dressed, and whole finfish subgroup index. From April to May wholesale prices for fresh-water fish (with the exception of whitefish) leveled off from the high levels that prevailed during the April Jewish holidays. The subgroup price index this May as compared with May 1959 was up about 3.2 percent due to higher prices for frozen dressed salmon and fresh-water whitefish and yellow pike at New York City. These increases more than compensated for lower prices for fresh drawn haddock (down 3.0 percent), fresh and frozen dressed halibut (down 12.6 percent), and Chicago drawn whitefish (down 4.5 percent).

The fresh processed fish and shellfish subgroup price index in May 1960 increased 6.3 percent from the preceding month due to a 9.7-percent increase in fresh shrimp prices at New York City and a 3.7-percent increase in shucked oyster prices. These increases more than compensated for a drop of about 1 cent a pound in the wholesale price for small haddock fillets at Boston. From May a year ago to this May this subgroup index rose 6.9 percent. Although the fresh haddock fillet prices were down sharply (21.7 percent) and fresh shrimp prices were lower by 1.2 percent, the increase of 22.2 percent in shucked oyster prices more than offset the decreases.



Heading and sorting halibut for size after unloading at the dock of a fishery firm in Seattle, Wash.

In mid-May 1960 the wholesale price index for processed frozen fish and shellfish increased by 1.3 percent from the preceding month. The wholesale prices for frozen 26-30 count shrimp at Chicago rose 4.7 percent or about 3 cents a pound. This jump in frozen shrimp prices was sufficient to overcome decreases of about 1/2 to 1 cent a pound in the wholesale prices for the frozen fillet items. In May this year the frozen processed fish and shellfish price index was down 1.8 percent from the same month of 1959. Although frozen shrimp prices were higher by 5.0 percent this May as compared with May last year, frozen haddock fillet prices were down 22.7 percent and flounder fillet prices were down 2.7 percent. Wholesale prices for frozen 26-30 count shrimp this May at 123.5 percent of the 1947-49 average were the highest since April 1959 when the index for this item was 128.1 percent. This price increase between April 1959 and May this year represents an increase of about 18 cents a pound from the low of 62 cents a pound reached in October 1959.

The primary wholesale canned fish price index was unchanged from April to May 1960. As compared with May 1959, the index this May was up 6.3 percent. All wholesale canned fish prices were higher this May than they were in May a year ago. Among the canned fish products included in this subgroup, the only product in good supply in May this year was canned tuna. Seasonal canning of Maine darlings and Pacific salmon began in May, but packs were extremely light.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, May 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/}		Indexes (1947-49=100)			
			May 1960	Apr. 1960	May 1960	Apr. 1960	Mar. 1960	May 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					126.6	123.3	123.4	121.7
Fresh & Frozen Fishery Products:					142.2	136.7	137.6	138.1
Drawn, Dressed, or Whole Finfish:					150.1	144.3	148.5	145.5
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.09	.06	94.1	60.8	116.9	97.0
Halibut, West., 20/30 lbs., drsd., fresh or froz.	New York	lb.	.30	.30	93.5	92.8	90.3	107.0
Salmon, King, lge. & med., drsd., fresh or froz.	New York	lb.	.82	.80	184.8	179.2	174.7	174.1
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.74	.98	183.4	241.7	195.8	192.1
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	1.05	1.05	212.5	212.5	144.7	192.1
Yellow pike, L. Michigan & Huron, rnd., fresh .	New York	lb.	.73	1.00	170.0	234.5	181.3	140.7
Processed, Fresh (Fish & Shellfish):					145.8	137.1	142.2	136.4
Fillers, haddock, sml., skins on, 20-lb. tins . . .	Boston	lb.	.27	.28	91.9	93.6	117.4	117.4
Shrimp, lge. (26-30 count), headless, fresh . . .	New York	lb.	.86	.78	135.1	123.2	127.2	136.7
Oysters, shucked, standards	Norfolk	gal.	6.88	6.63	170.1	164.0	167.0	139.2
Processed, Frozen (Fish & Shellfish):					117.7	116.2	109.1	119.8
Fillers: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.38	.38	98.1	98.5	98.1	100.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.26	.27	80.1	81.8	89.5	103.6
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.29	112.8	116.8	114.8	112.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.80	.77	123.5	118.0	104.5	117.6
Canned Fishery Products:					104.8	104.8	103.8	98.6
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . .	Seattle	cs.	24.50	24.50	127.8	127.8	127.8	117.4
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.10	11.10	80.0	80.0	77.9	77.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	8.00	8.00	93.9	93.9	93.9	83.9
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	88.8

^{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.



"GHOST" NETS THAT FISH YEARS AFTER THEY ARE LOST

"Ghost" nets that go on fishing years after they have been lost at sea are presenting a novel problem in many parts of the world, especially in the heavily fished waters around Iceland.

Some of the problems created by "ghost" nets--which may be fancifully compared with the fabled Flying Dutchman--were discussed this week at the headquarters of the Food and Agriculture Organization (FAO), Rome, Italy, by the Chief of the Fishing Gear Section of FAO's Fisheries Division.

"The gear concerned in Icelandic waters is the bottom-set cod gill-net made of non-rotting synthetic fibres, mainly nylon," he said. "Such nets are fitted with metal or plastic floats which, like the nets themselves, do not rot, and when the nets are lost by the fishermen, for instance due to broken buoy ropes, they are maintained in a fishing position by the floats.

RETRIEVED NETS FULL OF DEAD AND LIVING FISH: "It is only recently that fishermen have generally realized that the lost bottom-set nets do go on fishing on their own," he continued. "This has been proved when nets are accidentally retrieved some months or even years after they were lost and are found to contain great quantities of rotten fish and fish bones as well as live fish.

"It is not suggested that this is at present a problem which threatens any fishery but it is quite clear that steps must be taken to prevent lost nets remaining in a fishing position," he stated. "But the extent of the potential threat is indicated by the fact that in Iceland each boat engaged in gill-netting operates 75 to 90 such nets, and that these nets, in total, stretch over a length of about 4 kilometres. In the heavily fished areas in Icelandic waters, where sea conditions are often very rough, many kilometres of nets are lost each year."

The Chief of the Fishing Gear Section pointed out that the threat arising from "ghost" nets is likely to grow more serious in those waters where gill-net fishing is practiced on a large scale but should also be given attention in the developing fisheries in Africa and Asia.

COTTON FLOAT LASHINGS MAY PROVIDE ANSWER: "Suggestions have already been made for solving the problem," he said. "For example, one proposal is that the floats of such nets should be attached by untreated cotton which would quickly rot away if the nets are lost. Released from the floats, the nets would sink to the bottom and cease to catch fish. However, float lashings of this type would have to be renewed periodically and would be the cause of a lot of extra work by the fishermen.

"We have brought this problem to the attention of the International Council for the Exploration of the Sea and the International Commission for the Northwest Atlantic Fisheries, both of which are studying the problem in the hope of finding a practical solution," he added.

With the extensive and still rapidly expanding use of many varieties of synthetic fibre nets, there is need to take effective, practical action.

SYNTHETIC FIBRE NETS VASTLY INCREASE CATCHES: "Nets made of nylon and other synthetic fibres, including new types which have been developed recently, have already proved a boon to fishermen," he stated. "A simple but often very effective gear, gill-nets can be operated even from primitive unpowered craft. They have been particularly valuable in the drive to increase fish production in underdeveloped countries. For example, FAO has helped to introduce synthetic fibre nets in India and many of the countries of Asia and the Far East, with the result that fishermen are catching as much as five times more fish than they were able to catch with their traditional nets made from local fibres.

"But," he concluded, "as experience shows, there are unexpected draw-backs to be found in any innovation although I am quite sure that we shall soon solve this problem of 'ghost' net fishing."



International

EUROPEAN FREE TRADE ASSOCIATION

CONVENTION RATIFIED BY MEMBER GOVERNMENTS:

The diplomatic representatives of the Republic of Austria, the Kingdom of Denmark, the Kingdom of Norway, the Portuguese Republic, the Kingdom of Sweden, the Swiss Confederation, and the United Kingdom of Great Britain and Northern Ireland on May 3, 1960, deposited the instruments ratifying the Convention establishing the European Free Trade Association, also commonly known as the Outer Seven. Thus the Convention comes into force.

This Association was created in terms of a trading, not a political, community; a community open to anyone willing to trade with it.

The purpose is to increase the flow of trade between the seven countries and thereby to improve the standard of living. The seven countries have jointly decided to lower the tariffs between them and form a Free Trade Area.

A statement by Sweden's Minister of Trade pointed out that ". . . The integration within EFTA is in itself important, but we will continue our efforts towards a wider European association and for the liberalization of world trade. It is difficult, however, to be optimistic about the immediate possibilities to reach agreement on such an association. We seem to have run into a situation where a widening rather than a narrowing of the gap between the different trade groups may be impossible to avoid. But we shall strive to overcome the present difficulties, as otherwise the consequences for Europe would be very serious indeed. Nor should we forget that a split between

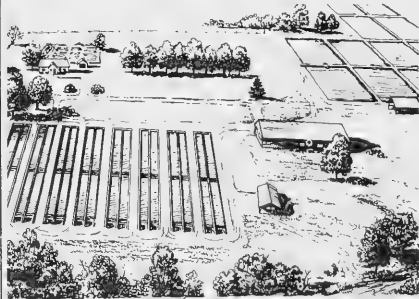
the industrialized countries of Europe would also mean reduced possibilities to help the underdeveloped countries--one of the main tasks of our time.

"The reason why I cannot be more optimistic now is the acceleration plan put forward by the Commission of the Six. Put into effect it would mean increased discrimination in Europe and a widening of the gap, even in a political sense. . ." (United States Embassy in Stockholm, May 4, 1960.)

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

EXPERIMENTAL SALMON HATCHERY BEING CONSTRUCTED IN CANADA:

An experimental sockeye hatchery is now being constructed by the International Pacific Salmon Fisheries Commission on Pitt River. The spawning grounds of



the sockeye in Pitt River are very unstable, with the result that the native population is unable to reproduce at a competitive rate with highly productive up-river races such as Chilko which migrate through the fishery at approximately the same time. As a result of poor spawning conditions the Pitt River sockeye runs have declined in nine of the last ten years and the es-

International (Contd.):

capement is rapidly reaching an unimportant level.

The hatchery will have a starting capacity of 4 million fry and is expected to be in operation in time for the 1960 run. New principles of operation will be tried at the outset and others added when justified by current research. The eggs will be incubated in complete darkness to eliminate the known adverse effects of light. The fry will be allowed to migrate from the hatchery to Pitt Lake in accordance with their natural instincts rather than be subject to arbitrary plantings regardless of the stage of physiological development.

The Fisheries Research Board of Canada determined 20 years ago that the artificial propagation of Fraser River sockeye and the release of un-reared fry did not justify the cost. The Commission believes, however, that new methods may provide for a successful operation and thus keep the Pitt River run of sockeye of sufficient size to utilize the tremendous rearing capacity of Pitt Lake which is 18 miles long.

* * * * *

FEBRUARY 1960 MEETING:

The International Pacific Salmon Fisheries Commission, which is responsible for the preservation, protection, and extension of the sockeye and pink salmon stocks of the Fraser River, met in Ottawa late in February 1960.

Under the chairmanship of DeWitt Gilbert, United States Commissioner, the Commission reviewed the results of its work to date, and reported on its continuing work to conserve the two salmon stocks in the area covered by the Convention signed by the United States and Canada.

The Commission was originally appointed in 1937 to restore the sockeye stocks of the Fraser River system. The Convention under which the Commission was set up was amended in 1957 to cover the conservation of pink salmon stocks in the same area. (Canadian Department of Fisheries Trade News, March 1960.)

LATIN AMERICAN FREE ECONOMIC ASSOCIATION

EXCHANGE OF RATIFICATIONS PLACES ASSOCIATION INTO EFFECT:

With the exchange of ratifications, the Latin American Treaty of Economic Association is in full effect. The Treaty was signed in February 1960, by Guatemala, El Salvador, and Honduras. The common market between these three countries becomes a reality, since free entry is allowed in any one of the three countries to the natural products or to articles manufactured in either of the other two countries with the exception of a few products which are subject to special regulations.

A communique of the Guatemalan Ministry of Economy published in the Diario de Central America on May 3 announced the exchange of ratifications of the Treaty. Also, the text of the resolution on Central American economic integration recently approved at San Jose, Costa Rica, by the Central American Ministers of Economy, also was published.

In accordance with the Economic Association Treaty, it is expected in the near future to establish the Development and Aid Fund, whose purpose will be to contribute financially to the integration and development of the three countries; this entity will provide a new source of stimulus for private investment.

The Republic of Nicaragua, at the recent meeting of the Ministers of Economy held in San Jose, Costa Rica, also indicated its desire to proceed with an accelerated economic integration with the rest of Central America.

At the San Jose meeting an agreement was signed between the Central American governments and the United Nations Special Fund in order that this organization shall aid the Central American Industrial Technology and Research Institute (ICAITI). On the basis of this aid, it is hoped that ICAITI will be capable of giving service to Central American industry in an ever-increasing efficient manner.

At the San Jose meeting it was also resolved that the work towards Central American customs equalization shall continue at the end of May; therefore, it is

International (Contd.):

expected that at the end of the year a Central American Uniform Customs Tariff Plan will be available. (United States Embassy in Guatemala, May 9, 1960.)

LAW OF THE SEA

CONFERENCE CONCLUDES WITHOUT ADOPTING PROPOSALS ON TERRITORIAL SEA AND FISHING ZONE:

In closing the United Nations Conference on the Law of the Sea in Geneva on April 26, 1960, the Conference President, Prince Wan Waihayakon (Thailand), expressed regret that it had not resolved vital problems affecting the width of the territorial sea and fishing zones.

The Conference concluded its work after rejecting or, because of the lack of a two-thirds majority, failing to adopt any substantive proposal on those two questions. It did, however, adopt a proposal expressing the need for technical assistance in fisheries.

In his statement, Prince Wan spoke of the need to make adjustments between the economic and political interests of coastal states and the principle of freedom of the seas. He expressed hope that, with good will, new efforts in due time would be made to arrive at agreement.

The session was formally completed April 27 with signature of the Final Act.

In a series of votes the Conference took the following action:

Failed to give a two-thirds majority to the United States-Canadian proposal which would have provided a six-mile territorial sea and granted another six-mile zone for exclusive fishing rights, with recognition of certain historical rights. The vote was 54 in favor, 28 against, with 5 abstentions. Those voting against the United States-Canadian proposal were Albania, Bulgaria, Burma, Byelorussia, Chile, Czechoslovakia, Ecuador, Guinea, Hungary, Iceland, India, Indonesia, Iraq, Libya, Mexico, Morocco, Panama, Peru, Poland, Romania, Saudi Arabia, Sudan, Ukraine, U.S.S.R., United Arab Republic, Venezuela, Yemen, and Yugoslavia. Abstaining on the United States-Canadian proposal were Cambodia, El Salvador, Iran, Japan, and the Philippines. Lebanon was absent.

Failed to give the required majority to a request by Arthur H. Dean (United States) for reconsideration of the vote on the United States-Canadian proposal. It received 50 votes in favor, 29 against, with 8 abstentions.

Failed to adopt the 10-nation proposal which would have left the width of the territorial sea in abeyance but would have granted a 12-mile zone of exclusive fishing rights. (The sponsors were Indonesia, Iraq, Lebanon, Mexico, Morocco, Saudi Arabia, Sudan, United Arab Republic, Venezuela, Yemen.) The vote was 32 in favor, 38 against, with 18 abstentions.

Rejected an Icelandic proposal under which preferential fishing rights would be granted to countries "overwhelmingly dependent" upon their coastal fisheries. The vote was 25 in favor, 37 against, with 26 abstentions.

Before voting on the United States-Canadian proposal as a whole, adopted an amendment to it submitted by Brazil, Cuba, and Uruguay, seeking preferential rights in zones of the high seas for countries particularly dependent on fishing. The vote was 58 in favor, 19 against, with 10 abstentions.

Adopted a proposal for technical assistance in fishing, sponsored by Ethiopia, Ghana, and Liberia. The vote was 68 in favor, none against, with 20 abstentions.

In the course of the discussion preceding the voting, Dean (United States) spoke of the concessions made by the maritime powers, and cited the "large majority" support for their stand, as opposed to the position of the minority. The 12-mile states, he said, had not made a single step toward general agreement.

A. K. Sen (India), explaining his vote against the United States-Canadian proposal, said that many countries feared the appearance of foreign warships close to their shores. In the first place, he said, there was no need for these warships to come so close. Twelve miles were required.

Grigori Tunkin (USSR), speaking in support of 12 miles and against the United States-Canadian proposal, said that 12-mile states, including China, represented 60 percent of the world population, and decisions could not be imposed.

André Gros (France), in announcing his decision to vote in favor of the United States-Canadian proposal, asked why 45 states, ever since the 1958 Conference on the Law of the Sea, had been making more and more sacrifice of legitimate interests while others had not even made a gesture of moving toward agreement.

Lubomir Radoulski (Bulgaria) warned that 12-milers would not recognize any six-mile decisions.

Najib Bouziri (Tunisia) said the existing situation of various limits was likely to prevail and the modus vivendi should be found perhaps through the adoption of the Joint United States-Canadian proposal, but with continued respect for the 12-milers.

Gudmund Gudmundsson (Iceland), replying to an earlier suggestion by the United Kingdom representative for arbitration of historic fishing rights off Iceland, said that the Conference itself was competent to decide, and he wondered whether Britain wanted to avoid putting its position to a vote of the general Conference.

James Dossen Richards (Liberia) and E. K. Dadzie (Ghana) called for support for their proposal on technical assistance.

Edwin Glaser (Romania) said that a bad solution was worse than no solution and he opposed the United States-Canadian proposal.

Alvaro Garcia Herrera (Colombia) supported as "reasonable solutions" the United States-Canadian proposal and the Latin American amendment.

Gideon Rafael (Israel) supported the United States-Canadian proposal and the request for technical assistance.

Antoine Fattal (Lebanon) said his major concern was preservation of the Arabic nature of the Gulf of Aqaba. He found the United States-Canadian proposal unsupportable toward that aim and said he would abstain.

After the series of votes, Turkey and Canada informally suggested the possibility of prolonging the Conference so that new efforts could be made, but the suggestions were not voted upon.

On April 26 the Conference failed to adopt a Cuban proposal for a protocol to the 1958 Convention on Fishing and Conservation of the Living Resources of the High Seas. The vote was 33 in favor, 22 against, with 24 abstentions.

Notes: Also see *Commercial Fisheries Review*, June 1960 p. 39.

NORTHWEST PACIFIC FISHERIES COMMISSION

JAPANESE-SOVIET NORTH PACIFIC SALMON FISHERY AGREEMENT SIGNED:

A Japanese-Soviet fisheries agreement limiting salmon catches in the northwest Pacific was signed on May 18,

International (Contd.):

1960. Negotiations between the two countries began in Moscow on February 2.

At the fourth annual meeting of the Japanese-Soviet Commission for Northwest Pacific Fisheries, the Soviets charged that indiscriminate Japanese fishing was preventing salmon from reaching the spawning grounds. The Russians proposed a complete ban on salmon fishing in half the area under discussion and a shorter fishing season in the other half.

In the agreement, which covers catches of salmon, crab, and herring, the Japanese accepted a quota of 67,500 metric tons of salmon this year in exchange for fishing rights in the previously restricted areas. Also, the Japanese agreed to accept closure of two new areas. The first is a triangle bounded by the southern Kuriles, the treaty area boundary, and 150° E. longitude. The second is a rectangle bounded by 46° N. and 48° N. latitudes, 155° E. and 160° E. longitudes. The quota for red salmon, within the over-all quota of 67,500 tons, is 15,500 tons or about 7,750,000 fish. The Japanese wanted a quota of 85,000 tons of salmon, the same as in 1959. In 1958, the quota was 110,000 tons. This year's quota for red salmon is 500 tons less than last year's.

The Soviets state that the limits on salmon catches are necessary to preserve dwindling stocks. The Japanese biologists disputed the Soviet claim.

TRADE AGREEMENTS

NEW PROTOCOL TO ICELANDIC SOVIET TRADE AGREEMENT INCLUDES FISHERY PRODUCTS:

The new 1960-1962 Protocol to the Icelandic-Soviet Trade Agreement of August 1, 1953, was signed in Moscow on January 23, 1960. It is believed that the new arrangement provides for approximately the same level of trade as prevailed during the past 2 or 3 years.

On the Icelandic export side, the most notable change is the reduction envisaged in salt herring shipments from 15,000

metric tons for 1957-1959 to 12,000 tons (150,000 to 120,000 barrels) per annum for 1960-1962. It is understood that the Soviet delegation wished to make a much deeper cut but that the Icelandic group insisted on 12,000 tons. This reflects the actual tonnage of salt herring actually purchased by the U. S. S. R. annually from Iceland during the past three years under the agreement.

As provided for in the 1960-1962 protocol, the most important export from Iceland will again be frozen fillets (30,000-32,000 tons annually), chiefly ocean perch and a small amount of cod. In 1957-1959, the amount was 32,000 tons annually. The contracts on fish provide for 30,000 tons of frozen fish fillets to be delivered to the Soviet Union during the calendar year 1960. The U. S. S. R. purchased 28,800 tons in 1959. The possibility is left open that additional amounts could be contracted for. Partly as a reflection of rising prices during the past several years on the world market for frozen fish products, the fish contract calls for a rise of approximately 3 percent in the price of ocean perch delivered to the Soviet Union, but no rise in the price of cod.

The 1960-62 agreement also provides for an unspecified quantity of frozen herring (the agreement for 1957-59 called for 1,000 tons).



Australia

MODERN TRAWLER TO EXPLORE FOR NEW DEEP-SEA FISHING GROUNDS:

The modern 514-ton deep-sea fishing trawler, *Southern Endeavor*, which arrived at Adelaide in January 1960 from Great Britain, will be used to survey the Great Australian Bight located off the South Central Coast for new deep-sea fishing grounds. A recently established trawling company based in Adelaide has given the vessel and her all Australian crew the task of locating sufficient quantities of fish to warrant the establishment of a deep-sea trawling industry. The *Southern Endeavor* will have one year to complete the task. If fish are found to be abundant the vessel will have paved the

Australia (Contd.):

way towards replacing large quantities of imported fish.

The vessel's captain, who is an experienced trawlerman, states that the venture is a blind gamble, but no more of a gamble than experienced when other new fishing grounds such as Greenland were opened up to fishing. He added, conditions may be different, but fishermen's techniques are the same wherever you go.

The Southern Endeavor was built in 1952, at a cost of more than £150,000 (about US\$336,000), and, as the Princess Elizabeth, has fished in the Arctic fishing grounds. The 161-foot vessel has a speed of 12 knots. (Fish Trades Review, January 1960.)

* * * * *

SURVEY FOR SPINY LOBSTER RESOURCES OFF SOUTHWEST COAST UNSUCCESSFUL:

An Australian Government survey of spiny lobster resources off the southern coast of Western Australia, begun in June 1959, was three months ahead of schedule when it was determined that spiny lobsters do not occur in those waters in sufficient numbers to support a commercial fishery. The survey, which was to continue until June 1960, thoroughly covered the area between Cape Riche and Nuyis Point, the Recherche Archipelago, and the area from Cape Leeuwin to Cape Naturaliste. It was financed from the Fisheries Development Trust Account.

Australia exported close to 7 million pounds (valued at US\$6.9 million) of spiny lobster tails to the United States during fiscal year 1958/59. The great majority of the exports has come from fishing grounds which have been developed along the coast of Western Australia in recent years. (The United States Embassy in Canberra, April 8, 1960.)



Bermuda

DEVELOPMENT OF FISHERIES UNDER CONSIDERATION:

Until now there has been no separate department of the Government devoted to the fishing industry. The responsibility for the promotion of commercial fishing has been charged to the Curator of the Aquarium--whose main duties relate to the operation of that tourist attraction.

In April it was announced that the Department of Agriculture will, in the near future, become the "Department of Agriculture and Fishery," embracing a new branch for the promotion of commercial fishing. This move is the result of a strong recommendation to that effect by several experts who conducted a Government-sponsored inquiry into the Colony's commercial fishing potentialities and issued three detailed reports between June 1955 and August 1958. To date, the only active measure by the Government to conserve the Islands' edible sea resources has been a ban on the possession of spiny lobsters from April 15 to August 31 of each year. A bill to set back the date of the beginning of the closed season to April 31--and thus to enable local hotels and restaurants to feature lobsters on Lenten and Easter menus--was passed by the House of Assembly in March, but a few days later was rejected by the Legislative Council.

Despite the fact that Bermuda is surrounded by a 450-square-mile reef area teeming with fish, an estimated 40 percent of all fish consumed in the Islands is imported. In 1957, these imports amounted to about 620,000 pounds; in 1958, 700,000 pounds; and in 1959, about 725,000 pounds. The local catch is estimated at 1,250,000 pounds a year. The increasing use of freezers by the Colony's hotels, restaurants, markets, and households has encouraged increased importation of fish.

Only about 100 Bermudians are engaged in full-time commercial fishing. Their boats are small, and lack Diesel engines and refrigeration facilities. As a result, long and expensive daily round trips are required in order to reach the best fishing grounds ("the banks," located 25 to 35 miles southwest of Bermuda).

Bermuda (Contd.):

Furthermore, adverse weather restricts their activity, and the total catch during winters drops as much as 80 percent. The fact that the fishermen have been eking a fair living out of the sea has restrained them from seeking Government aid or even advice.

The establishment of a Department of Agriculture and Fishery may mark the beginning of an important new industry in Bermuda. If the Government earnestly adheres to its oft-announced policy of fostering greater domestic food production in order to reduce reliance on imports, there is much it can do to promote the production of food from the sea, just as much has already been done through the Department of Agriculture to foster production of food from the land. Among the possible courses of action are: the granting of a yearly subsidy (a 10 percent subsidy at current rates would be about US\$35,000 a year); the acquisition of large, Diesel-engine, freezer-equipped vessels with modern fishing gear capable of fishing several days at a time; construction of large-scale freezing plants and other storage facilities; establishment of an island-wide system of marketing; compilation of statistics on the size, composition, and trends of the catches; and the development of a research program. (United States Consulate report from Hamilton, April 29, 1960.)



Brazil

FISHING OPERATIONS BY JAPANESE CRITICIZED:

It is now estimated that there are 55 Japanese fishing vessels operating off Brazil's northeastern hump fishing for tuna. Ranging in size from 80 tons to 800 tons, the Japanese vessels are becoming an increasingly sore subject for the nonmechanized Brazilian fishing industry. Presently only one of the vessels operates from Brazilian ports.

The Japanese firm participating in the INBRAPE (Industria Brasileira de Pesca e Frios S/A) operation in Recife is also

being scrutinized by a representative of the Ministry of Agriculture and Fisheries who arrived in Recife during March.

Critics report that the Japanese boats are continually being switched to avoid the nationalization of the boats as their contract requires and that Brazilian fishermen hired by the Japanese as trainees (also under the terms of the agreement) are discharged as they approach the proficiency required for the mastery of modern fishing techniques. (United States Consulate report from Recife, April 19, 1960.)



British Guiana

FISHING INDUSTRY EXPANDS IN 1959:

The British Guiana fishing industry made notable progress in a number of different fields during 1959. The year's biggest success was undoubtedly achieved by an American-owned fisheries and trading company, which after three years of frustrating and profitless operations, at last found shrimp in sizable quantities in April 1959. Between April and December, the company exported, mostly to the United States, about 1,140,000 pounds of shrimp, valued at about US\$745,000. This in turn stimulated interest among American shrimp vessel owners and in local business circles, and a marked expansion of shrimp fishing out of British Guiana is expected in 1960.

The biggest plans are being laid by a new firm which bought out the fisheries and trading company early in 1960. This new firm is working to double the size of its fishing fleet (from 20 to about 40 boats), expand its cold-storage and ice facilities, and purchase additional wharfage space in Georgetown harbor. Other American shrimp fishing companies have shown an interest in coming to British Guiana, and the New Amsterdam Chamber of Commerce has begun negotiations with French and Japanese interests in the hope of enticing a shrimp fishing operation into Berbice. The British Guiana Government is hopeful that the industry can provide additional jobs in the Georgetown area. The new seafoods company employs about 200 workers.

Spurred on by the good shrimp landings, the Government has intensified its own efforts to boost the annual production of fish. A research project to test offshore fishing grounds was completed in early 1959, and the Fisheries Division of the Department of Agriculture reported that the most productive areas were found between 10 and 20 fathoms. Following this survey, reports indicated that some 500 small fishing craft and several deep-sea trawlers began fishing in earnest in these waters. Catches ran as high as 30,000 pounds for the large trawlers, and by the year's end, the Government wholesale fish marketing center reported that 6,659,000 pounds of fish had passed through the municipal market at Georgetown. Encouraged by these figures, the Government announced that all fish imports would be stopped at some unspecified future date. This proposal does not, however, appear to be realistic, for fish imports for 1959 again totaled about 6 million pounds.

Another minor success in 1959 was scored by British Guiana's small but growing tropical fish-exporting companies. Sales of guppies and other small aquarium fish totaled about US\$400,000, with the United States purchases about 90 percent of British Guiana's exports. Demand apparently surpasses available supply, but the industry has thus far failed in its efforts to cultivate these exotic fish in ponds. However, such artificial cultivation continued to be successful at Onverwagt, the Government fish culture station in West Berbice where edible

British Guiana (Contd.):

fish are raised in sea water. This station again expanded its operations in 1959 in the hope of inducing private individuals or cooperatives to establish fish ponds. (United States Consulate report from Georgetown, April 26, 1960.)

**British West Indies****BARBADOS FISHING INDUSTRY
IMPORTANT AS A SOURCE
OF BASIC FOOD:**

The fishing industry of Barbados in the British West Indies is an important source of a basic food for the population and employment for about 2,300 persons. In 1959 the fisheries landings sold through established fish markets were valued at US\$1,687,000, a slight drop from the 1958 value of \$1,702,000. The total of fisheries landings is about 10 percent higher when sales outside of established markets are included.

Flyingfish account for 60 percent of the landings, with dolphin, kingfish, albacore, and red snapper following in that order. Spiny lobster and turtle are also caught and marketed.

The fishing fleet has largely been converted from sail to power boats with the assistance of Government loans, and the number of power-driven boats increased from 412 in 1958 to 451 in 1959.

The 1960/61 budget provides US\$1 million for an abattoir and fish-freezing plant which, when completed, will provide storage and insure more orderly marketing and better distribution. (United States Consulate report from Barbados, April 28, 1960.)

**Burma****FISHERY TRENDS,
FOURTH QUARTER, 1959:**

The Burmese Government Defense Services Institute (DSI) has established a joint fishery venture with a Singapore fishing company. Deep-sea fishing operations about 80 miles off the coast of Mergui (East of the Andaman Islands)

were started in October 1959 with 14 motor trawlers from Singapore. The DSI takes 65 percent and the company 35 percent of the catch. The vessels are manned by about 100 Chinese fishermen from Singapore, with about 80 Burmese undergoing training. It is reported that the number of trawlers is to be increased to 50, and that the area of operations will be extended to waters off the Arakan coast.

During the fourth quarter of 1959 an official of the Institute, during his trip to Europe, arranged with the Norwegian Government for a deep-sea fishing survey in Burmese waters. Arrangements were also made to send Burmese to Norway for training in deep-sea fishing. The Government recently issued over US\$3 million in import licenses for fish, with the Army Fisheries Project the sole purchasing agent. The DSI hopes that the survey and training of Burmese will ultimately enable it to fulfill Burma's fish requirements from an entirely home-based industry, under DSI control. (United States Embassy, Rangoon, report of April 5, 1960.)

**Canada****ARCTIC CHAR FISHERIES:**

The Arctic Unit of the Fisheries Research Board of Canada is studying arctic char in Frobisher Bay, in association with the commercial fishery being operated there by Eskimos under the supervision of the Department of Northern Affairs. Another arctic char commercial fishery is in operation in Ungava Bay, also under the sponsorship of the Department of Northern Affairs. This is under biological study by the Quebec Department of Fisheries, which is working closely with the Board's Arctic Unit.

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**LOBSTER SEASONS CHANGED IN
CERTAIN AREAS OF MARITIMES:**

Changes in the regulations affecting lobster fishing in two Canadian Maritimes lobster districts have gone into effect. The changes apply to District 8, comprising Kent and Westmorland Coun-

Canada (Contd.):

ties in New Brunswick and the western half of Cumberland County in Nova Scotia, and District 5, which takes in the Guysborough County and the eastern half of Halifax County in Nova Scotia.

In District 8 the open season for catching lobsters has been changed to extend from August 10 to October 10, which is five days longer than in 1959. In District 5 there has also been a lengthening of the open season, with fishing being permitted ten days earlier, so that the legal catching period now is April 10 to June 20.

These slightly longer seasons will have no detrimental effect on conservation and will bring them more in line with seasons in other districts.

In addition to these changes, in District 5 the minimum size at which lobsters may be taken has been increased from $2\frac{7}{8}$ inches to 3 inches. This is in accordance with the expressed desire of the great majority of fishermen in the area.

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RESOLUTIONS ADOPTED AT THE 15TH ANNUAL MEETING OF THE FISHERIES COUNCIL OF CANADA:

At the 15th Annual Meeting of the Fisheries Council of Canada in Vancouver, B. C., April 25-27, 1960, the resolutions adopted by the Meeting ask the Canadian Government to:

1. Repeal a law which discriminates against East Coast fishermen competing with foreign vessels.

2. Remove hindrances to the adequate building up of the Canadian fishing fleet.

3. Put an end to its activities in the competitive field of food merchandising in the domestic market where it has offered pork products at less than cost.

4. Participate in an international conference on fish meal production if such a conference is arranged.

5. Arrange that the Fisheries Research Board of Canada set up a special

research program to develop other uses and products from the British Columbia herring and whaling resources.

6. Sit down with industry to jointly explore the desirability of a market research program in Canada aimed at uncovering the basic attitude of the Canadian consuming public towards fish on which future promotional programs, both by Government and industry, can be based.

7. Implement a study of methods to encourage the production of better-quality light-salted and heavy-salted cod.

* * * * *

SCALLOP LANDINGS EXPECTED TO INCREASE IN 1960:

Scallop landings in the Canadian Maritime provinces this year are expected to surpass those of all former years. January to October 1959 the Canadian fleet landed 4 million pounds of scallop meats as compared with 2.9 million pounds for the same period in 1958, an increase of 40 percent. The value of those landings increased from C\$1.1 million in 1958 to C\$1.6 million in 1959. The increase in landings was the result of increased efforts by offshore vessels fishing Georges Bank, off the Gulf of Maine. Inshore landings were greatly reduced.

The study of the sea scallop is being renewed by both Canadian and United States scientific investigators. One set of experiments has already been completed on Georges Bank, with a large-mesh scallop dredge, which is designed primarily to reduce the number of small unmarketable scallops which are damaged and thus wasted by handling on board fishing vessels. The dredge also improves efficiency in the capture of market-size scallops.

The joint Canadian-United States studies are being carried out at the request of the International Commission for the Northwest Atlantic Fisheries. In the immediate future the program calls for an investigation into how the scallop lives and reacts to its environment and to fishing gear in order to better appreciate its population dynamics. The first task is to study the early free-swimming larval stages which at present are

Canada (Contd.):

almost unknown, but are undoubtedly of great importance in determining the densities of future scallop populations. (Canadian Trade News, March 1960.)



Cuba

CLOSED SEASON ON FROGS ENDED, BUT ONE ON SEVERAL SPECIES OF FISH ANNOUNCED:

The Cuban National Fisheries Institute, by a Resolution published in the Official Gazette No. 86 of May 5, 1960, imposed a closed season on the species biajaiba (lane snapper), corvina (croaker), and robalo (snook). The capture of those species is prohibited effective from May 5, 1960, through August 5, 1960.

Another resolution published in the same Official Gazette terminated the closed season on the capture of the bullfrog species had originally been imposed on April 1, 1960. (United States Embassy report from Habana, May 10, 1960.)

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CLOSED SEASON ON SPONGES ANNOUNCED:

The Cuban National Fisheries Institute, by a Resolution published in Official Gazette No. 80 of April 26, 1960, declared a closed season on the taking of sponges from April 25, 1960, to July 25, 1960, both dates inclusive. The area included in the closed season prohibition covers the western maritime zones, and the zones north of Caibarién and south of Batabanó. The taking of sponges in the north coast of Vuelta Abajo, Pinar del Rio Province, however, is permitted. (United States Embassy report from Habana, May 4, 1960.)



Denmark

RAINBOW TROUT PRODUCERS ASSOCIATION DISSOLVES:

On April 27, 1960, the Danish Minister of Fisheries declared himself unable

to decree minimum prices for trout exports, in the face of an unfavorable Government Industry Committee vote on the proposal to continue existing price arrangements until June 1, 1960. On May 2, the Association of Trout Producers dissolved itself for announced reasons of "mutual disunity."

The immediate cause for these events was the recent discovery that two trout producers in North Jutland had exported large trout shipments to the United States and Canada at prices significantly below the agreed minimum.

The meeting of the trout producers at Esbjerg on May 2 was called ostensibly to reconsider methods of price control. A system of export fees, variable according to the export market, was reported to be under consideration, as well as other measures to prevent a price war. The inability of the producers to agree on any scheme resulted in the decision to dissolve the organization.

Stocks of exportable trout are low in the spring, so the effect of the abolition of the minimum on export prices will probably be postponed for some months. Price cutting is expected, however, because of the competition between Japan and Denmark on the United States market. (United States Embassy report from Copenhagen, May 4, 1960.)

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SOME FISHERY PRODUCTS NO LONGER REQUIRE IMPORT LICENSES:

As of March 1, 1960, the Danish Government extended the list of imported products that no longer are subject to import license requirements. Among the products no longer subject to import licensing are: fish and shellfish for canning; and canned fish products. (Foreign Trade, May 7, 1960.)

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UTILIZATION OF FISHERY PRODUCTS, 1958-1959:

During 1959, Denmark utilized 591,276 metric tons of fishery products. This represents an increase of 10.3 percent over the 536,144 tons used in the preceding year. As compared with 1958,

Denmark (Contd.):

the amount of herring available in 1959 dropped by 9.3 percent, but the quantity of miscellaneous fishery products (prob-

Denmark's Utilization of Fishery Products, 1958 and 1959		
	19591/	19582/
	.. (Metric Tons) ..	
Plaice and flat-fish fillets	17, 683	12, 672
Flounder	4, 141	3, 916
Dab	3, 135	4, 574
Cod and cod fillets	38, 078	39, 385
Herring	264, 569	298, 271
Sprat	8, 303	8, 329
Mackerel	9, 213	10, 069
Garpike	924	1, 184
Other salt water fish ^{3/}	229, 655	142, 439
Total salt-water fish	575, 701	520, 839
Eel	251	174
Pond, trout	586	531
Fresh water fish	57	104
Total fresh-water fish	894	809
Mussels (in shell)	8, 856	8, 461
Starfish	2, 364	2, 984
Crustacea	3, 461	3, 051
Total invertebrates	14, 681	14, 496
Grand Total	591, 276	536, 144

1/ Preliminary figures.
2/ Final figures.
3/ Includes fish for reduction.

ably large quantities of fish for reduction) increased by 61.2 percent. (United States Embassy report from Copenhagen, May 6, 1960.)



Ecuador

FOREIGN VESSELS PERMITTED TO FISH FOR BAIT IN TERRITORIAL WATERS:

In Decree No. 464-c of March 4, 1960, published in the *Registro Oficial* No. 1091 of April 9, 1960, Ecuador authorized commercial fishing by foreign vessels in Ecuadoran continental and insular territorial waters upon obtaining the applicable permits. This permission does not extend, however, to cod, shrimp, lobster, or whales.

The decree prohibits both Ecuadoran and foreign vessels from fishing for bait in zones within one kilometer along the coast from both sides of coastal towns and one kilometer into the ocean. Domestic fishermen ("pescadores domesticos"--presumably those without power-driven boats), however, may fish within these areas.

Foreign fishing vessels are forbidden to enter the mouths of estuaries in the Gulf of Guayaquil and the Archipelago of Jambeli or to engage in fishing activities beyond an imaginary line running in an east-west direction across the mouths of the Guayas River and the Estero Salado from Boca de Naranjal (2°39'30" S. lat. and 79°56'5" long.) to Boca del Morro (2°39'5" S. lat. and 80°15' W. long.).

Captains of foreign vessels which engage in commercial and bait fishing in Ecuadoran continental and insular territorial waters are required to submit to Port Captains detailed reports of their catches, including amounts, species, and locations.

This decree annuls previous decrees and dispositions, in particular Decrees Nos. 955-A of April 29, 1955, and 1085 of May 14, 1955, which prohibited or limited foreign vessels from fishing in these waters. Its practical effect is to permit bait fishing by foreign vessels within the one kilometer limit from the coast where it was previously forbidden, except in the immediate vicinity of towns, and also within the Gulf of Guayaquil, including the Morro and Jambeli Channels. The decree is an effort to legalize the existing situation and to derive revenue through the sale of fishing permits.

Although fishermen at Manta have protested the decree and have complained that better equipped foreign vessels get the bulk of available bait, there has been relatively little other unfavorable reaction to the decree. The Guayaquil newspaper *El Telegrafo* in an editorial of March 13, 1960, supports the decree on the grounds that the Government now will obtain revenue from heretofore clandestine fishing. The Consulate General in Guayaquil reports that a European marine biologist has informed it that there is sufficient bait for all and that fishing by foreign vessels is not causing a local shortage. (United States Embassy, Quito, May 4, 1960.)



El Salvador

SHRIMP FISHERY TRENDS, FIRST QUARTER 1960:

At the end of the January-March 1960 quarter the President of El Salvador, in analyzing the local shrimp industry, noted that licenses had been granted for 58 shrimping vessels, of which 47 are presently operating. For the first two months of 1960, catches were at a level three times those of the same months of 1959, largely due to the increased size of the fishing fleet. Most of the production is being marketed in the United States, and the largest producer (with over half the operating craft) is preparing to sell its own name brand in the United States.

Present participants in the industry are now joining the Government in calls for conservation measures. Meanwhile, talk of possible United States quota restrictions against shrimp imports are causing considerable concern to the Salvadoran Government (shrimp is the country's third largest export product) and to the industry. (United States Embassy, San Salvador, report of April 13, 1960.)



French West Africa

CONFERENCE DISCUSSES FUTURE OF SENEGALESE TUNA FISHING AND CANNING INDUSTRY:

Plans for the future of the tuna fishing and canning industry that is centered in the Dakar area were discussed on January 29 and 30, 1960, at a conference between French, Senegalese, and Mali government and industry officials.

Heralded as "Tuna Fish Days," it was another example of the growing impetus being given to the tuna industry in Senegal, the latest indication of which was the creation on March 9, 1960, of a Fisheries Council by Decree No. 60-105 of the Council of Ministers.

The conference was devoted to studying the problems of the current tuna as well as defining the expected policies of Senegal for the development of the tuna industry and the potentials which are

presented for Senegal in the European Economic Community (EEC) and world markets.

In regard to the 1959/60 tuna fishing season, it was revealed that although original plans called for 40 tuna clippers, a total of at least 56 tuna-fishing boats were active, nine of which are equipped with freezing plants. It was hoped that 16,000 metric tons of tuna would be landed in the 1959/60 season, of which 7,500 tons would be canned in Dakar.

To assist in the total catch, the native fishery would make a contribution. It was pointed out at the Conference that over 45,000 tons of many varieties of fish were caught annually by around 10,000 fishermen utilizing 3,000 of the native "pirogues." However, 80 percent of this catch is sold fresh, and is mostly caught within the maximum five-mile range of the nonmotorized "piroque."

The plans developed by the conference for developing the tuna fishing industry are ambitious and if realized, will create a major new industry for Senegal. Foremost amongst these plans to make Dakar one of the world tuna centers is the intention to erect a "California" type processing plant with a yearly capacity of 50,000 tons. This would be part of the proposed new fishing pier in Dakar, and if realized, would consist of not only the processing and freezing plant, but also an area for drying fish, a can manufacturing plant, and facilities for efficient disposal of waste from the fish processing operation.

To accomplish this goal, Senegal has requested assistance amounting to 300 million francs CFA (over US\$1,220,000 at the official rate of 246.8 francs to the dollar) from the EEC Development Fund, which, it is understood, will be granted in the not distant future. Also, a commission has been established to study the technical, legal, and commercial aspects of this development, and private enterprise is being sounded out with the hope of creating a mixed public and private company for the management of the planned cannery.

Other future projects were likewise considered during the conference. Foremost among these is a general improve-

French West Africa (Contd.):

ment of the shore facilities and equipment. Beaching facilities are to be improved where possible. A project receiving wide publicity is the motorization of "pirogues," 30 percent of which are already equipped with outboard motors for which the government pays 15 percent of the price to assist the individual fisherman in modernization. In 1951, motorized "pirogues" hardly existed and their effectiveness is reflected in the fact that the catch went up 10,000 tons in a few years.

On a larger scale lies the desire to create a larger Senegalese tuna fleet, since at present the majority of the vessels operating in the area are French or Spanish, the latter currently owning 16 of the total of 56. With the construction of the processing plant, it is hoped that all foreign ships will be drawn to Dakar to process their catch thus making it the tuna capital of the Atlantic.

The problem of markets was explored vigorously. While expressing the hope that the Community will provide a preferential market, the participants in the Dakar conference on tuna gave indications of pressing for a broader horizon of activity on which the United States, and particularly the EEC, appear in the forefront. Great interest was shown in extending the market, already existing in Italy, into Germany, which promises large consumption, particularly of canned tuna in brine. For this purpose, extensive participation is planned in West German trade fairs to promote African tuna sales.

Pressure will probably be put upon France to direct more of its tuna purchases to Senegal, which is complaining about low-priced acquisitions from Morocco, Tunisia, and New Hebrides by the French market.

There is also the hope that the interior market of Africa can be enlarged by sales promotion activity. In confirmation of the importance of the tuna industry, as displayed by the conference, the latest manifestation of Senegal's interest is seen in the establishment of a Fisheries Council on March 9, 1960. It

is to act as a consultative body for matters concerning maritime fishing, and is to study technical, juridical, social, and economic questions which are brought to its attention by the Government or by private enterprise. It has to prepare administrative plans and organizational programs, and coordinate under the direction of the Administration the interests and activities of the different professional elements.

The Council is composed of representatives of the various ministries, services, and agencies, the legislative assembly and the Mali Government. In addition to these, representatives of the various fishing industries, such as the tuna industry and fishery cooperatives, are to be appointed by ministerial decree, and experts and specialists may be called upon as the situation requires it.

Statements by representatives of both Senegal and France emphasized the desire for cooperation, and it will probably be along such lines that events will develop. However, clashes between representatives of African and French tuna interests occurred during the conference, showing the possibility that perhaps at some future time differences might arise on the subject. The main source of friction resided in the easy availability of French markets to nations outside EEC, French acceptance of bonito from Morocco in direct competition with Senegal's albacore, and the desire on the part of Senegal to have its own fleet which, naturally, would tend to displace some of the French clippers.

Native fishing continues to receive a big push from the Senegalese Government, and with considerable success. Although this does not have much bearing on world markets, it is of great importance to Senegal as fish enters heavily in the diet of the Africans.

The important factor as to the actual wealth of the fishing grounds off the coast of Senegal was not discussed at the conference. The impression is given that all concerned took it for granted that the supply of fish was plentiful and that a shortage was not expected to develop in subsequent years even when

French West Africa (Contd.):

the catch is greatly increased. (United States Consulate in Dakar, April 4, 1960.)



Gabon Republic

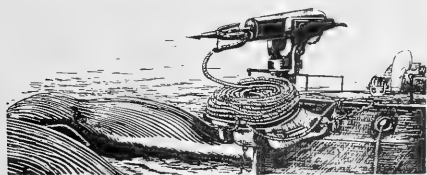
WHALING INDUSTRY REVIVED IN 1959:

In 1959 whaling was resumed off the coast of Gabon (formerly part of French Equatorial Africa) after an inactive period of seven years. The industry is small and the monopoly of one company (Sté des Pêcheries Coloniales á la Baleine), but it provides one more source of revenue for the new Republic.

Each year from July-October the coast of Gabon is frequented by schools of migratory humpback whales from the Antarctic. The whales average 35 to 40 metric tons, and provide 7-8 tons of oil and 2 tons of whale meal. After World War II, a small industry was built up by the whaling company from a base at Cap Lopez near Port-Gentil. The company used seven catcher vessels of 250 tons, one factoryship of 10,000 tons, and killed 4,207 whales which produced 29,718 tons of oil and 3,673 tons of meat. Ruthless hunting soon depleted the stocks to where operations were unprofitable and in 1953 all whaling was halted. By 1959, the whale stocks had built up again to the point that the Government of Gabon authorized the renewal of the industry with controls on the number of whales taken.

On March 13, 1959, the whaling firm was given exclusive rights to whaling off Gabon for five years (1959-1963). It is

WHALE HARPOON GUN



a French-controlled company with Norwegian participation. The Norwegian

capital is 35 percent of the total of US\$303,000. The whale limit was 600 for 1959 and the season was established for August and September in conjunction with the International Whaling Convention. The number of hunter boats is also controlled. The Cap Lopez Station, which was constructed in 1949, comprises 34 autoclaves and a factory for preparation of whale meat meal for fodder; and it employs 300 persons. The whaling fleet is composed of one 16,000-ton Norwegian tanker, one naval auxiliary (M/S Pontos), and two hunter boats with crews totaling 96 men.

During the 1959 season considerably less than the 600 whale limit was obtained. A total of 178 whales were killed and produced 1,375 tons of oil and 322 tons of whale meal, making the season a net loss. It is expected that 1960 will be more favorable. One of the problems encountered, and probably a reason for the low catch in 1959, is the activities of the offshore seismicographic survey teams making oil explorations. The dynamite explosions scared away some whales and after numerous irate whaler complaints the seismicographic teams are now under orders to stop explosions when whales are nearby.

Gabon expects an annual revenue of US\$40,000-\$70,000 from the industry in turnover and other taxes. This is considerably less than was obtained during the previous whaling period after World War II. The Government hopes, however, to avoid overhunting again and thus insure a longer period of activity even if at a lower profit. Since offshore oil exploration is expected to cease in the next year in the region, chances are favorable that the whaling industry will remain for a number of years. (United States Consulate in Brazzaville, January 16, 1960.)



Hong Kong

RESEARCH VESSEL REPLACED BY TRAWLER-TYPE VESSEL:

The Fisheries Research Unit of the University of Hong Kong was established as a subdepartment of the Department of Biology in September 1952. The Unit's

Hong Kong (Contd.):

research vessel, the Alister Hardy, after five years of service with the Unit, was replaced early in 1960 by the research trawler Cape St. Mary (238 gross tons and 130 feet). The replacement vessel is equipped with biological and chemical laboratory accommodations, and berths for three scientists. She has echo-sounder, radar, and radio transmitter and receiver. The vessel's program includes a trawling, hydrological, and plankton survey of the continental shelf between the Gulf of Tongking and the south coast of Tawain.



Iceland

AMNESTY FOR PAST VIOLATIONS OF 12-MILE FISHING LIMIT GRANTED:

On April 29, 1960, the President of Iceland, upon the recommendation of the Minister of Justice, proclaimed an amnesty for past violations of the unilaterally-imposed 12-mile fishing limit around Iceland. Following on the heels of the British decision not to send warships within the 12-mile zone, the announcement was received in Iceland with hope that these conciliatory moves would avoid a further crisis. The Icelandic amnesty had the effect of absolving United Kingdom trawler captains of charges of fishing inside the 12-mile limit which have accumulated since Icelandic regulations became effective September 1, 1958.

The purpose of the amnesty is to allow foreign trawlers to seek shelter inside the 12-mile limit or to make emergency calls at Icelandic ports without threats of arrest for past offenses. (United States Embassy, Reykjavik, May 6, 1960.)

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FISHERY LANDINGS IN 1959
ESTABLISH A NEW RECORD:

Icelandic fishing vessels' over-all landings during 1959 amounted to about 100 tons per fishermen employed in the industry. It totaled 556,200 metric tons, an increase of 10 percent over 1958.

Prior to 1959, the landings in 1958 had established a new record. There were, however, some significant changes, says the annual economic report on Iceland for 1959, issued by the Board of Trade in London.

The report reveals that a drop of 23 percent in the trawler catch was due to Iceland's 12-mile fishing limit under which Icelandic trawlers are barred from fishing inside 12 miles--except for a short period--in limited areas.

The effect of the limitation became fully apparent during the spring fishing and at the time when fishing is usually at its best in March and April. The Icelandic trawler landings were one-third below normal while the small boat landings unaffected by the 12-mile limit increased by 13 percent. The landings of herring during the year rose by 70 percent, but this species is mainly caught by small boats.

While the catch by Icelandic trawlers fell by 23 percent, the small boat catch rose by 31 percent. During the year the trawlers had much less success in their fishing for ocean perch off Newfoundland. The catch of cod by trawlers was 41.5 percent less than in 1958, the smallest catch of this species by Icelandic trawlers for many years. In part, the lower catch of cod was due to the time taken up in sailings to the Newfoundland ocean perch fishing grounds where the yield hardly justified the effort involved.

The report estimates the value of Iceland's fish exports last year at around £25 million (US\$70 million), or some £77,000 (\$215,600) less than in 1958. "The fall in value was due partly to difficulties in disposing of salt fish, and of fish meal and oil which now face severe competition from Peruvian supplies. There was also an increase in value of unsold stocks during the year," the report reveals.

At the beginning of 1959 unsold stocks were estimated at about £5½ million (\$15.4 million), and this figure had risen by some £2 million (\$5.6 million) by the end of the year.

The Icelandic fishing fleet increased by a total of 17 vessels during the year

Iceland (Contd.):

and now consists of 43 trawlers, 61 fishing vessels of over 100 tons, 619 vessels of under 100 tons; and 42 other smaller craft, total tonnage 117,528. Ten of the new vessels added were 250-ton trawlers from East Germany.

"Next year five new large trawlers will be delivered, mainly from yards in West Germany, and there will also be quite a large addition to the boat fleet of some 40 vessels. These have mainly been ordered to replace older wooden fishing vessels," the report added.

The report states that some 800 Faroese seamen were employed on Icelandic vessels during the 1959 season, but for the 1960 season the Faroese have refused to take employment in Icelandic fishing vessels unless special wage terms are granted to compensate for the devaluation of the Icelandic krona.

There is now a general shortage of seamen for the fishing fleet, especially on trawlers.

Landings in 1959 included 226,400 metric tons of cod, 183,000 tons of herring, 98,800 tons of ocean perch, and 18,000 tons of haddock. (Fishing News, April 1, 1960.)

Note: See Commercial Fisheries Review, June 1960, p. 46.

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FISHERIES TRENDS AS OF MID-MAY 1960:

With Iceland apparently embarked on a third consecutive good fishing year and with reason to anticipate victory in the 12-mile fisheries dispute with Britain, cautious optimism is being voiced in fishery circles. This is primarily a short-range view based on the following:

1. The spring cod season neared its close with predictions that it would even exceed last year's good catch.
2. Large schools of herring were sighted in Faxa Bay, which appeared to herald a fine spring herring season.
3. If a bill now in Parliament passes, drag-net fishing for flounder will be permitted in specific areas within the 12-mile limit.
4. The British Trawler Owners Association decided to keep its vessels outside the Icelandic 12-mile limit for at least three months pending possible settlement of the dispute.
5. Despite deliveries of new vessels this spring, the fisheries were not hampered to the extent feared by manpower shortages. Perhaps 200-300 Faroese seamen participated in the fisheries.

The Government's resolution of the export tax question May 6 led to speedy settlement of the long-deadlocked fish-pricing problem.

Although the February 20 Economic Act imposed a 5-percent tax on all exports, uncertainty as to its termination date had complicated efforts to reach a fish price to be paid boat owners by the processors. The processors had urged both a cut in the tax and its early termination to ease their competitive position abroad. The Government cut the export tax to 2-1/2 percent and will probably terminate it by the end of the year.

Thereupon the negotiators reached a price of Icelandic kronur 2.63 per kilogram (3.1 U. S. cents a pound) on line fish and 2.53 per kilogram (3.0 U. S. cents a pound) on guttet net fish for the February 15-May 20 season.

In line with recent efforts to step up the quality of fish products, the Government had encouraged the setting of a higher price differential as between line fish and net fish. The small difference is about the same as last year's, however.

On May 12 a bill for limited drag-net fishing had its first reading in the Parliament. The bill would provide for licensed drag-net operations for flounder within certain areas inside the 12-mile fisheries limit. The yearly period involved would be from June 15 to October 31. These operations generally would be confined to boats of 35 tons or less and permits would be valid only for one season.

The bill would amend acts passed in 1937 and 1948 respecting control of drag-net fishing and is not directly related to the trawler 12-mile limit dispute with Great Britain. However, the manner in which Iceland controls flounder fishing within these limits, will reflect on the general efficacy of the country's fish conservation methods. Critics of the present bill allege it is not based on scientific fish conservation procedures. (United States Embassy report from Reykjavik, May 16, 1960.)



India

EXPORTS OF FISH AND SHELLFISH FROM COCHIN, 1956/57-1958/59:

All of the frozen shrimp exported from South India to the United States is shipped via the port of Cochin. Shrimp exports from this port are included under the category "fish and prawns." Exports to the United States under this classification in fiscal year 1958/59 (July 1-June 30) amounted to 1,351 short tons valued at US\$1,119,000, as compared with only 505 tons valued at \$509,000 in fiscal 1957/58 and 595 tons valued at \$495,000 in fiscal 1956/57. Exports to the United States of fishery products other than frozen, dried, or canned shrimp, and spiny lobster tails are negligible. In addition, India also exports some frog legs to the United States which are probably not included in India's statistics on exports of "fish and prawns."

All four South Indian states (Kerala, Andhra Pradesh, Madras, and Mysore)

India (Contd.):

Exports of Fishery Products from Cochin (India), 1956/57-1958/59							
	Quantity			Value			
	1959/58	1958/57	1957/56	1959/58		1957/56	
	(Short Tons)			1,000 Rupees	US\$ 1,000	1,000 Rupees	US\$ 1,000
Total	4,767	6,621	5,144	14,733	3,109	14,933	3,151
To United States . . .	1,351	505	595	5,304	1,119	2,412	509
							2,345
							495

have programs for fishery development. The implementation of these programs for expansion of fisheries should result in greater landings. (United States Consulate, Madras, April 18, 1960.)

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EXPORTS AND IMPORTS OF FISHERY PRODUCTS, 1959:

Exports of fishery products by India in 1959 amounted to 61.1 million pounds, valued at about US\$12.9 million. Principal countries of destination were Ceylon, Singapore, United States, and the United Kingdom.

valued at about \$1.4 million (exclusive of frog legs, which according to United States Customs records amounted to 182,000 pounds in 1959). Exports to the United States included 2,393,000 pounds of shrimp, 62,000 pounds of canned shellfish (mostly shrimp), 541,000 pounds of unclassified canned fish, and 153,000 pounds of other shellfish (presumably spiny lobster tails). Other items exported to the United States amounted to about 7,000 pounds and probably consisted of Oriental specialty items. Exports of fishery products to the United States made up 4.4 percent of the total quantity exported and

India's Exports of Fishery Products, 1959

Product	Quantity		Value			
	To U. S.	All Countries	To U. S.		All Countries	
	(1,000 Lbs.)		Rupees/	US\$	Rupees/	US\$
Fish and shellfish other than canned:						
Fresh fish (live or dead)	3	90	5,441	1,145	75,244	15,841
Fish, not salted	-	3,407	-	-	569,664	119,929
Fish, dried, salted, or smoked	2	50,650	1,830	385	40,659,888	8,559,976
Shark fins and other	-	623	-	-	1,898,716	399,730
Crustacea (except shrimp)	153	159	289,075	60,858	324,191	68,251
Shrimp	2,235	11,598	4,675,261	984,265	15,090,285	3,176,902
Total fish and shellfish other than canned	2,393	66,527	4,971,607	1,046,653	58,617,988	12,340,629
Canned fish:						
Shellfish	62	63	188,047	39,589	189,210	39,834
Canned fish other than sardines	541	750	1,357,686	285,829	2,106,445	443,462
Sardines and pilchards	-	4	-	-	19,830	4,175
Other	-	3	-	-	8,190	1,724
Total canned	603	820	1,545,733	325,418	2,323,675	489,195
Other products (not canned)	2	445	5,000	1,053	116,669	24,562
Total all products	2,998	67,792	6,522,340	1,373,124	61,058,332	12,854,386

Imports of fishery products by India in 1959 totaled 34.3 million pounds, valued at US\$6.1 million. Imports from East and West Pakistan made up about 70 percent of the total imports in 1959.

In 1958, India's exports of fishery products were close to 64.3 tons, valued at \$12.2 million; imports totaled 24.3 million pounds, valued at \$4.3 million.

The United States share of India's export trade in fishery products in 1959 amounted to about 3 million pounds

10.7 percent of the value of all fishery exports. (United States Embassy, New Delhi, May 11, 1960.)



Indonesia

SHRIMP FISHERY UNDEVELOPED:

Although there are no Indonesian statistics on shrimp landings, observers have reported the presence of substantial shrimp resources in Indonesian waters,

Indonesia (Contd.):

both small shrimp in coastal waters and large shrimp farther out to sea. However, no facilities exist to market efficiently the light landings of shrimp. Nor are there facilities for increasing the catch. There are no foreign companies engaged in shrimp fishing in Indonesia.

It is estimated by the International Cooperation Administration Fisheries Advisor that approximately one-half of the shrimp catch is for immediate use and that the remainder is sold commercially. Shrimp is readily available in restaurants. The Fisheries Advisor estimates that more than one million pounds of shrimp per month could be produced if the facilities were available. However, nothing is presently being done to develop or assist the commercial development of the Indonesian shrimp resources. (United States Embassy in Djakarta, May 9, 1960.)



Japan

ALBACORE TUNA LANDINGS AT PORT OF YAIZU:

On May 21, 1960, the port of Yaizu, Japan, had albacore landings of 130 metric tons, the highest yet registered this season at that port or at the other principal Shizuoka Prefecture bait-boat port of Shimizu. Despite research agencies' predictions that summer albacore fishing would be good this year, fishing has been slow in getting started, and both Yaizu and Shimizu daily albacore landings have not previously risen above the 100-ton mark.

After three consecutive poor seasons, the good landings on May 21 aroused hopes of a good season.

In May the best fishing grounds were around Torishima, where some boats were reported to have taken as much as 20 tons of albacore. About 40 boats landed fish on May 21, and prices were US\$350 a short ton for large albacore and \$345 for medium fish. (The Suisan Keizai, May 22, 1960.)

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FROZEN TUNA EXPORTS,
APRIL 1, 1959 TO MARCH 31, 1960:

Japanese exports of frozen tuna in the 1959 export year (April 1959-March 1960), according to the Ministry of International Trade and Industry, were as follows (figures in parentheses are for the 1958 export year):

To the United States and Canada: albacore by freighter from Japan--24,818 tons (27,195 tons); albacore by transshipment--4,406 tons (960 tons); yellowfin shipped from Japan--31,285 tons (48,360 tons); yellowfin by transshipment--11,874 tons (8,364 tons). To Italy--12,835 tons (11,624 tons). To Yugoslavia--8,655 tons (none). To other European countries--8,583 tons (70 tons). Big-eyed tuna--611 tons (3,432 tons). Skipjack--1,111 tons (2,753 tons). Total--104,206 tons (103,642 tons). (The Suisan Tsushin, May 20, 1960.)

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TUNA MOTHERSHIPS SAIL FOR
FISHING AREAS:

The first Japanese tuna mothership to sail for the fishing grounds this year was the No. 3 Tenyo Maru, which departed from Tokyo on May 3, 1960. The second was the Nojima Maru (8,504 tons gross) which sailed from Kobe on May 18 for the Fiji Islands area.

The Nojima Maru fleet comprises 46 fishing boats (including 2 scouting boats), the earliest of which sailed for the fishing grounds in the first part of May. The fleet will rendezvous and begin operations off Fiji. Plans call for production of 5,700 metric tons of frozen fish, a slight increase over last year's 5,500 tons.

This year a total of five fleets will carry on mothership-type tuna fishing. In the grounds north and south of Fiji, the No. 3 Tenyo Maru will be replaced in August by the Tenyo Maru, which is at present fishing in the Bering-Sea and processing fish meal.

This year the three companies that have been engaged in the mothership tuna fishery asked the authorities for an expansion of the fishing area, permission to use portable catcher boats, and an increase in the catch quota, but their requests were denied and the mothership-

Japan (Contd.):

type tuna fishery is to continue under the same regulations as in the past. However, the Government's policies for this fishery are scheduled for a change after the end of this year. (The Suisan Keizai, May 20, 1960.)

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PLAN TO INTRODUCE SALMON IN SOUTH AMERICA:

A Japanese Diet member has advanced the idea of seeking a way out of the gradual cutting back of Japan's North Pacific salmon fishery by developing the waters around South America. He has already sounded out the opinions of South American governments on this scheme.

The plan has advanced to where the Diet member will soon make a trip to South America with a party of Hokkaido legislators to study conditions there. The schedule for the trip is not yet decided, but the idea is to have a member of the staff of the Japanese Fishery Agency accompany the party, and to center the investigation on the rivers of Chile (The Suisan Tsushin, May 21, 1960.)

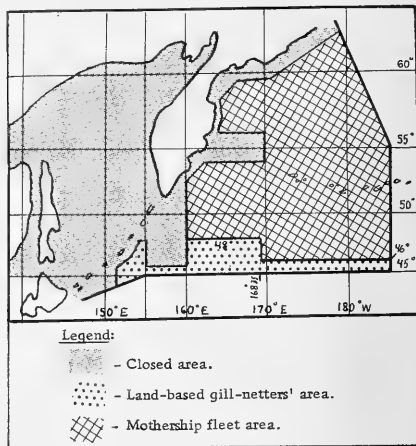
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NORTH PACIFIC SALMON FISHERY TRENDS:

Japan's 12 salmon mothership fleets sailed for the North Pacific fishing grounds May 19, 1960. The licenses distributed before the fleets sailed had provisionally been made out for 100 tons a catcher boat.

The land-based fishermen who operate south of 46° N. latitude made strong representations to the authorities to increase their share of the total catch quota as compensation for their having had new closed areas established in their fishing grounds by the Japanese-Soviet Commission for Northwest Pacific Fisheries at this year's meeting in Moscow. The Japanese authorities found it difficult to take this step, and so they issued provisional licenses. On the other hand, the mothership operators claimed that in the past three years' settlements they have been on the short end, their operating areas having been more and more restricted without any change in the ratio of allocation of the catch quota. Pointing out that the land-based fishermen can operate freely south of the treaty area, the mothership operators claim that the demand for a reapportionment of the quota is unfounded and absolutely unacceptable. The quota of 67,500 metric tons was divided as follows: the mothership fleets were assigned a quota of 54,000 tons and the land-based gill-netters a quota of 13,500 tons. The land-based gill-netters got a higher share than in the past—a 4 to 1 ratio instead of the traditional 5 to 1. In addition, the land-based fishermen, to compensate them for the new closed areas near Hokkaido, got a piece of the mothership operating area, at approximately 46° N. to 48° N. latitude, 165° E. to 169° E. longitude.

Salmon gill-netters and long-liners operating east of Hokkaido were finding the schools and having good fishing



Japanese North Pacific salmon fishing areas for 1960.

in May 1960. The grounds are about 140-150 miles east of Hanasaki, along 41° N. latitude. The fish were smaller than in the average year, and red salmon fishing was good. The price was also good, because of the delay in beginning salmon mothership operations caused by the Japan-Soviet fishery negotiations. Aside from the specially high price at the time fishing began April 22, the prices at Kushiro have been about 20 percent higher than last year's. On May 13 landings were 215 metric tons and on the 14th 240 metric tons. The entire land-based fleet was operating with 340 fishing vessels.

Pink-salmon fishing on the Japan Sea side moved north in Hokkaido waters in May, and 230 Hokkaido boats were fishing there. About 100 tons a day were being landed, and the ports were suffering a shortage of freight cars.

The salmon fleets sailed four days later this year than last. Some fishermen complained that because of the delay they would miss the high-priced red salmon.

The Japanese catch quota for 1960 agreed on at the Moscow meeting was 67,500 metric tons, as compared with 85,000 tons last year. Within the quota the red-salmon quota is 15,500 tons, estimated as 7,750,000 fish. Last year it was 16,000 tons or 8 million fish. Once again, not more than 2.5 million of the red salmon are to be caught west of 165° E. longitude.

At the Moscow meeting it was also decided that in 1960 the existing areas within the convention area, in which the capture of salmon on the high seas by movable fishing gear is prohibited, will be continued as last year. Furthermore, in order to protect the pink-salmon resource of the west coast of Kamchatka, this year only there will be a cessation of the capture of salmon by movable gear in the two zones within the convention area south of 48° N. latitude. Of the total number of drift nets used in the salmon fishery in 1960, not less than 25 percent shall have meshes measuring 65 mm. from knot to knot.

In addition, in order to protect the crab resource, commercial fishing for crab will not be carried on in 1960 in several areas adjacent to the west coast of Kamchatka, and certain other measures will be taken.

The Commission has agreed on policies for joint scientific investigation of salmon, crab, and herring. The necessity for an exchange of fishery experts in 1960 has also been recognized and recommendations have been made to the contracting parties to implement such exchange.

Japan (Contd.):

The Commission's fifth meeting will convene on January 23, 1961, at Tokyo. The Commission ratified the Protocol of its fourth meeting on May 18, 1960.

According to an official message from the Japanese Ministry of Foreign Affairs to the Ministry of Agriculture and Forestry, the details of the areas newly closed to Japanese salmon fishing in the North Pacific in 1960 are as follows:

A rectangular area bounded by 45° 51' N. and 48° N. latitude, 155° E. and 160° E. longitude; and a triangular area between the boundary of the convention area and 151° 30' E. longitude. (The Suisan Keizai, May 21; Nippon Suisan Shimbun, May 23; and Nippon Keizai Shimbun, May 19, 1960.)

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TWO WHALING FLEETS SAIL FOR NORTH PACIFIC:

The Japanese 14,000-ton whaling factoryship Kyokuyo Maru sailed for the North Pacific from Yokohama on May 21, 1960, with 10 catcher boats. The fleet, jointly operated by three Japanese fishing companies, is scheduled to reach the whaling grounds on May 27 and to continue operating until September. In addition to the factoryship and catcher boats, the fleet also includes 3 refrigerator ships, 6 carriers, and a tanker. Production plans call for a catch of 70 blue whales, 1,420 fin whales, and 120 humpback whales (800 blue-whale units in all) and 200 sperm whales. These are expected to yield 12,000 metric tons of baleen oil, 18,080 tons of frozen whale meat, 800 tons of salted whale products, 48 tons of whale-liver oil, and 5 tons of other whale products; 1,700 tons of sperm oil, 500 tons of frozen sperm whale meat, 6.8 tons of sperm whale-liver oil, and 141 tons of salted and other sperm whale products.

On May 20 the No. 2 Zunan Maru (13,000 tons gross) sperm-whale fleet, jointly operated by five Japanese companies sailed from Kobe for the North Pacific. Besides the factoryship, the Zunan Maru fleet comprises 7 catcher boats, a refrigerator ship, and 2 carriers; this fleet will also be served by the same tanker as the Kyokuyo Maru fleet. The fleet will operate from May 28 to August 10 and will return to Japan August 18. It plans to catch 1,600 sperm whales (average length 45 feet), and produce 12,512 metric tons of oil, 3,520 tons of refrigerated meat, 1,088 tons of salted

meat, 53.5 tons of liver oil, and 4.8 tons of teeth. (The Suisan Tsushin, May 21; The Suisan Keizai, May 22, 1960.)



Mexico

SHRIMP EX-VESSEL PRICE WAR AT CAMPECHE AND CARMEN:

Another increase in shrimp ex-vessel prices on April 18, 1960, the fourth since April 2, marked the continuance of the price-war that has been going on in Carmen and Campeche, Mexico, for about two months. The price war, originating in Carmen, had had its influence on ex-vessel prices in Campeche and to a lesser extent in Salina Cruz. It is reported to be a struggle between two companies over control of the Carmen shrimp fleet.

The struggle, coming at this time, has been viewed with considerable apprehension by the rest of the shrimp companies in Mexico since they feared it might affect their position during the price negotiations with the cooperatives. Only members of fishery cooperatives are permitted to catch shrimp in Mexico, but only a small fraction of the shrimp fleet is owned by the cooperatives. Consequently, each year the boat owners collectively negotiate with the cooperatives over the ex-vessel price to be paid for the shrimp. The negotiations, under government supervision, were scheduled to begin on May 15 this year.

Price increases since April 2, 1960, reportedly have been restricted to Carmen and Campeche. Salina Cruz prices are reported not to have increased.

At Carmen and Campeche, between April 2 and April 18, ex-vessel prices, for certain sizes, increased by as much as 7 U. S. cents a pound for the 21-25 and 26-30 count and 3 U. S. cents a pound for sizes larger than 21 count to a pound. The same price is being paid for all varieties of shrimp at Carmen and Campeche. (United States Embassy dispatch from Mexico, April 19, 1960.)

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Mexico (Contd.):

FISHERY TRENDS FOR YUCATAN PENINSULA:

State of Yucatan: Fishery products taken from the waters off the State of Yucatan (located in the northern part of the Peninsula of Yucatan) are primarily fish such as the grouper, rather than shellfish. Few shrimp or spiny lobster are found. Catches which enter commercial channels are generally sold to a cold-storage plant at Progreso. Others are sold locally as fresh fish, especially when brought ashore at small ports at some distance from Progreso. Problems which have retarded the Yucatan industry are the absence of refrigeration facilities and the use of small boats which are limited to fishing in good weather near shore.

The Yucatan Governor's 1960 program envisages the organization of the industry, the construction or acquisition of larger boats, experimentation with refrigerated vessels, and the construction of refrigerating plants in small ports, especially Sisal, Chelem, Chuburna, and Telchac Puerto. The Governor predicts that a daily catch of 50 tons could be realized with larger boats and an organized industry. An obstacle to the refrigeration plants is the absence of electricity.

State of Quintana Roo: The waters off Quintana Roo from Isla Mujeres south to Chetumal apparently contain a considerable amount of spiny lobster judging from reports. There are several fishing cooperatives operating out of Chetumal and commercial landings of spiny lobster, reportedly, could be profitable both on the island of Cozumel and at Isla Mujeres if the problems of refrigeration and transport could be solved. Despite the interest of the Governor of Quintana Roo in the development of the industry, including the construction of cold-storage plants and exportation, foreign investments are risky. The current lobster season ended on March 15, states an April 25, 1960, report from the United States Consul in Merida.

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POSTPONEMENT OF SHRIMP FISHERMEN'S PRICE NEGOTIATIONS PROBABLE:

Although official announcement has not yet been made, it is probable that negotiations between the Mexican fishermen's cooperatives and vessel owners concerning the price to be paid fishermen for 1960/61 shrimp landings will be postponed for three months. The 1959/60 contract expired on May 15, 1960, and normally negotiations would begin on that date. However, the Government has asked for, and the National Chamber of the Fishery Industry has agreed to, a three months' postponement. As of May 10, the Chamber had not received confirmation of the postponement, but reliable sources believed the present contract probably will be extended. The purpose of the postponement is to provide more time for the Government to study the industry in all its aspects.

Shrimp fishing in Mexico is reserved for the fishermen's cooperatives. By far the greater portion of the trawl fleet is owned by persons other than the fish-

ermen. The price the vessel owners pay the fishermen's cooperatives is fixed by a negotiated contract. The negotiations are held under governmental supervision.

In the past, separate negotiations have been held at different times and different contracts have been signed for the Gulf of Mexico and for the Pacific Coast fisheries. This year, though different contracts eventually may be signed, the negotiations for both the Pacific and the Gulf will be held jointly. (United States Embassy, Mexico, May 10, 1960.)

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SHRIMP FISHERY TRENDS:

March 1960: Higher shrimp ex-vessel prices, the settlement of the Guaymas boat lay-up, and the U. S. Tariff Commission hearings on the effect of shrimp imports in the United States industry were the principal items of interest to the Mexican shrimp industry in March. Landings and exports were about the same in March 1960 as in the same month of 1959.

During March ex-vessel prices rose 6-8 U. S. cents a pound at the Gulf of Mexico's port of Carmen and 7-11 U. S. cents a pound at Salina Cruz on the West Coast. Price increases reflect both an improved market and a local price war centered about Carmen-Campeche and carried over to some extent to Salina Cruz. At the end of the first week in April ex-vessel prices were:

Size (No. Per Lb.)	At Ciudad del Carmen		At Salina Cruz	
	White, Brown, & Pink	Brown	White	White
Under 15 . . .	70	55	57	
15/20	65	53	55	
21/25	55	43	45	
26/30	50	39	39	
31/35	47	-	-	
31/40	-	37	37	
36/40	39	-	-	
41/50	34	32	32	
51/60	29	-	-	
51/over	-	27	27	

After about two months of inactivity the Guaymas shrimp fleet put out to sea on March 20. The price dispute was settled on March 19. Reports indicate that mostly brown shrimp were being landed at Guaymas.

Salina Cruz landings also were mostly brown shrimp. At Carmen landings

Mexico (Contd.):

were over 60 percent whites during the first half of March, but during the last half there was a shift to a preponderance of pinks. Campeche landings ran about 90 percent pinks and most of the remainder were whites.

A succession of northerly winds kept Gulf of Mexico landings down in March. Carmen landings averaged less than 600 pounds-per-trip during the first three weeks. The last week of March showed average landings of more than double that amount. Campeche landings ran about 850 pounds per trip until the last week when they rose to over 1,200 pounds-per-trip.

The white shrimp landed at Carmen were of good size, about two-thirds were 30 count and under. Most of the pinks were 31 count and over. About 65 percent of the Campeche landings were 30 count and under.

The National Chamber of the Fishery Industry sent two representatives to Washington to testify before the U. S. Tariff Commission in opposition to proposed legislation for import duties and quotas on shrimp. (United States Embassy in Mexico City, April 19, 1960.)

April 1960: The opening of a new shrimp-breeding plant and rising ex-vessel prices in the Gulf of Mexico ports of Carmen-Campeche were developments of interest in the Mexican shrimp fishery during April. Shrimp landings and exports in April were reported at a level slightly above those of April 1959.

A shrimp breeding plant started operating in Salina Cruz on Mexico's west coast the last of April. This makes two such plants for Mexico. The first plant is located in Coatzacoalcos, Veracruz. When the new plant is in full production Mexico will have a daily capacity (one eight-hour shift per day) of between 9,000 and 10,000 pounds of breaded shrimp (finished product).

Shrimp ex-vessel prices in April continued to rise at Carmen and Campeche due to a local "price war." There

were no changes in Salina Cruz ex-vessel prices in April.

Size (No. Per Lb.)	At Carmen-Campeche		At Salina Cruz	
	White, Pink, & Brown	Brown	White	White
	.. (U. S. Cents a Lb.--Headless) . .			
Under 15	80		55	57
15/20	72		-	-
16/20	-		53	55
21/25	67		43	45
26/30	62		39	39
31/35	57		-	-
31/40	-		37	37
36/40	47		-	-
41/50	42		32	32
51/60	35		-	-
51/over	-		27	27

As customary at this time of year, Salina Cruz landings were reported to be dropping off. With some improvement in weather, Carmen-Campeche landings averaged somewhat higher than during March. Carmen boats averaged about 800 pounds of shrimp tails per trip and Campeche about 950 pounds in April.

Carmen shrimp species composition shifted from about 80 percent pink the first week of April to about 50 percent white the next two weeks and to about 60 percent brown during the last week. Size composition also shifted from about 70 percent 31 and over the first week to about 60 percent 30 and under the following two weeks and to about 60 percent 31 and over the last week.

Campeche landings also varied in species and size composition although not as widely as at Carmen. The first week about 90 percent of the landings were pink and 10 percent white, running about 75 percent 30 and under count. The second week they ran about 80 percent pink and 20 percent white with a few browns. The sizes dropped to about 50 percent 30 and under. The third week they ran about 70 percent pink, 20 percent brown, and 10 percent white, with about 60 percent 30 count and under. The last week they were about 85 percent pink, 10 percent white, and 5 percent brown, with about 75 percent 30 count and under. (United States Embassy, Mexico, May 11, 1960.)

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VERACRUZ AREA MACKEREL FISHERY TRENDS:

The mackerel fishing season covering the first quarter of 1960 and part of

Mexico (Contd.):

April proved to be more profitable to Veracruz area fishermen this year than last. They obtained higher prices--between 1.90 and 2.20 pesos a kilogram (6.9-9.0 U. S. cents a pound), and sold more fish.

The higher prices are due to the fact that the purchasing monopoly which was plaguing the fishermen and keeping prices low has now disappeared, at least temporarily.

The larger quantity of fish sold may be partly due to a campaign which was carried on by the Mexican Government for cheaper fish. Increase of sales to Mexico City was particularly noted. (United States Consulate report from Veracruz, April 26, 1960.)



Morocco

FISHERIES TRENDS,
FIRST QUARTER 1960:

The first quarter of the year is not a particularly active time for the Moroccan fishing industry, but during the period exports continued at a high level, the canned sardine export quota for the next year and a half was set, and the Marine Fishing Institute increased its activities. Preliminary figures show a total catch very slightly below that of the 1958 season. However, the export of canned fish so far this season (from June 1959 through May 1960) as of the end of March is better than in the last 10 years except for the banner year of 1957. Sales of canned sardines are holding up well, being about the same as the average for the last ten years. Tuna and other canned fish exports bring the totals up. Figures for January this year show better sales than normal.

With the encouragement of these good sales, canned sardine export quotas were raised. A committee of Government and private representatives met in February, and the decision was made to export 230,000 more cases this season and to set the quota at 1,900,000 cases for the 1961 season. Both these figures represent increases over the last year and will require strenuous efforts to fulfill.

In conjunction with this heightened optimism, activities were intensified in the Marine Fishing Institute with the help of additional personnel detached from the corresponding French institute. Continued efforts are being made to use electrical fishing apparatus in the particularly salty Moroccan waters. Success has been reported in research on an inexpensive sardine paste, and work continues on the improvement of fish meals and flours.

Unofficial figures on the 1959 landings indicate a total of 355.8 million pounds. Landings included 201.2 million pounds of sardines, 55.5 million pounds of mackerel, 3.1 million pounds of spiny lobster, 94.6 million pounds of other inshore and offshore fish, and 1.4 million pounds of other shellfish.

Discussions took place between representatives of all segments of the Moroccan fishing industry at a meeting of the Central Committee of Fishing in Casablanca from April 13-15, 1960. Recommendations were made for the construction of small boats for coastal fishing and for the creation of a Moroccan fleet for deep-sea fishing. Priority of purchase was urged for fresh fish for internal consumption in conjunction with the campaign for increased domestic consumption of fish and fish products. Commissions were formed to study modernization and commercialization. (United States Embassy in Rabat, April 18, 1960.)



Netherlands

ANTARCTIC WHALING EXPEDITION
COMPLETES 1959/60 SEASON:

The management of the Netherlands whaling company has announced that the expedition headed by its 26,830-ton factoryship Willem Barendsz ended operations on April 15, 1960. Total production for the 1959/60 season was 26 percent higher than during the 1958/59 season.

Product	Seasons	
	1959/60	1958/59
	... (Metric Tons) ...	
Whale oil	23,505	18,663
Liver oil	11	12
Meat meal	4,711	3,696

The management stated that it was satisfied with the total catch, even though the daily output was disappointing, as the catch season comprised 122 days compared with 69 days for the 1958/59 season.

The entire whale oil output for the current season has reportedly been sold at £72.5 (about US\$203) per long ton (2,240 pounds) to a British firm. This is the same price at which the whale oil was sold during the previous season and in view of the present lower price level on



Netherland (Contd.):

the international whale oil market, it was better than expected. The price paid by the British firm for the Dutch whale was the same as that paid for Norwegian oil.

The Netherlands whaling company recently concluded a contract with a large Japanese fisheries company for the delivery of whale meat at a price of fl. 100 (US\$26.53) per metric ton (about 1.2 U. S. cents a pound). The Netherlands company will be able to deliver about 6,000 tons of whale meat to the Japanese firm per year. The Japanese firm will shortly have a freezing installation available and will process the whale meat into pet food and expects to sell these products to a British firm at a price of fl. 700 (\$185.68) a metric ton or close to 8.4 U. S. cents a pound.

Since the production of whale products exceeded 20,000 tons during the 1959/60 season, the Netherlands whaling company, in accordance with an agreement with the Netherlands Government, will pay a six percent dividend this year, according to an April 27, 1960, dispatch from the United States Consulate in Amsterdam.

Note: Also see Commercial Fisheries Review, June 1960, pp. 53 and 57



Norway

COD FISHERY TRENDS, MAY 1960:

North Norway's annual Lofoten cod fishery, largest of its kind in Europe, gave poor results this year. When the 1960 season closed in April, after nearly three months of hectic activity, fishermen had landed a total of 37,387 metric tons of cod. This was 6,790 tons less than last year and only about 3,000 tons more than in 1958, the worst Lofoten season in this century. Landings in the past decade have averaged about 55,000 tons a year, while the average number of fishermen was nearly twice as large as in 1960. At the peak of the 1960 season, 9,766 fishermen were engaged in the Lofoten fishery. The average, however, was only 5,683 men in 1,683 fishing craft, the lowest ever recorded.

Prospects seemed bright when the Government fishery inspectors went to work on January 31. Reports indicated that large shoals of mature cod were approaching the Lofoten Islands. And the cod did show up, but most of the time the fish were too low in the water to be readily caught by drift nets. Line fishermen and jiggers made out better. Purse-seiners were banned from Lofoten for the second year in a row.

The inspection service in Lofoten covers the 116-nautical-mile stretch from Risvær in the east to Råst in the west. The chief of the district and his 60 assistants have

full police authorities while the season lasts. Conditions in ports and on the banks are checked throughout each day, partly by cruising around in the eight speed boats at the disposal of the inspection service.

The Lofoten fishery is conducted according to fixed rules, some of which date back to the 18th century. Vessels depart for the banks and return to port at a certain hour of the day, with special signals for coming and going. Inspection vessels follow the fleet both ways. Night fishing is not permitted, and Sunday is a day of rest. On the banks, inspectors make certain that drift-nets and long-liners stay within their allotted strips of water without encroaching on each other. Jiggers are free to fish anywhere they please.

Fishermen must observe stringent Government regulations for handling their catch. As soon as the cod are hauled aboard, they must be held to keep the meat white. Then, they must be gutted to prevent bacterial growth. Finally, the fish must be thoroughly washed while still at sea.

When the cod (bled, gutted, and washed) are delivered to filleting and freezing plants ashore, inspectors are on the job to check quality, packaging and weight, visiting each plant at least once a day. Strict government regulations require that only fish which were alive when bled may be used for filleting. The code of procedure also stipulates the method of filleting and freezing, types of packing, and modes of transportation. The inspectors who enforce this code work directly under the Norwegian Directorate of Fisheries.

Only a fraction of the total Norwegian fish catch which in 1959 was 1,369,665 tons, goes to filleting and freezing plants. In 1959, these had a combined production of about 30,000 tons, largely cod fillets. It takes 10 pounds of raw fish to make 4 pounds of fillet, so processing plants consumed altogether some 75,000 tons to achieve the 1959 output.

Most of the Norwegian frozen fish is exported to earn valuable foreign exchange. All but a few of the 30 odd freezing plants in North Norway distribute their products through a jointly-owned sales organization (Norsk Frossen-fisk A/L) whose fillets and fish sticks are sold in 20 foreign countries. Of the 24,000 tons sold last year, over 20,000 tons, worth Kr. 70 million (US\$979,000) went to foreign customers. The United States, which is Norsk Frossen-fisk's biggest market, took over 8,500 tons.

The second largest producer of frozen fish fillets in Norway (A/S Findus, Oslo), has its plant at Hammerfest, northernmost town in the world. About 75 percent of the 5,000 tons produced there annually is exported. The principal markets are in Great Britain and Sweden. Under a government proposal, now before Parliament, the North Norway Development Fund would be authorized to guarantee a Kr. 12.5 million (US\$174,825) loan for Findus to expand its annual plant capacity to 10,000 tons. (News of Norway, May 12, 1960.)

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GOVERNMENT VOTES AID FOR FISHERMEN:

The Norwegian Storting on March 14, 1960, appropriated 22 million kroner (US\$3,080,000) for the aid of the herring and cod fishermen during the first half of 1960. The amount will be apportioned as follows: kr. 14.5 million (\$2,030,000) for gear subsidies; kr. 6.0 million (US\$840,000) for support of cod fish prices in North Norway; kr. 1.0 million (\$140,000) for bait subsidies; and kr. 0.5 million (\$70,000) for other aid to the cod

Norway (Contd.):

fishermen. According to an official of the Ministry of Fisheries, an additional kr. 8 million (\$1,120,000), of which kr. 4 million (\$560,000) is to be used for price supports, will be appropriated later for the second half of 1960.

In 1958 the Storting had appropriated kr. 34 million (\$4,760,000) for the cod fishery, nearly all of which went into price supports. The shift away from price supports to gear and bait subsidies follows a recommendation of the Brofoss Committee which had investigated means of increasing the profitability of the fisheries. In view of the size of the price support program in 1958, the Storting determined that it would be inadvisable to discontinue the practice completely in 1960.

The eventual discontinuation of price supports will remove one of the causes of the dispute between the fish filleting and freezing industry and the North Norway fishermen's marketing organization, over the alleged discriminatory policy of the organization in the distribution of the price support funds. The freezing industry has been complaining because the price support funds have been used to support the prices paid by other cod processing industries and not those paid by the freezing industry. The organization maintains that the freezing industry can afford to pay higher prices and does not need any price support funds. (United States Embassy, Oslo, March 18, 1960.)

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SUPPORTS 12-MILE FISHING ZONE:

Norway's representative to the 88-nation Conference on the Law of the Sea at Geneva declared on March 31 that his country would support the Canadian proposal. This calls for a territorial sea limit of 6 miles, plus an adjacent 6-mile fishing zone from which foreign fishing vessels would be barred. The statement on Norway's position was made before Canada and the United States submitted their joint compromise plan of 6 miles territorial sea plus 6-miles fishing zone with 10-year cut off for those nations with historic rights in the outer six-mile zone.

Norway's representative observed in part: "Our first conference, held in 1958, showed clearly that it would be impossible to reach a general agreement which would give coastal states the right to extend their territorial sea or their fishing zone beyond 12 miles. It was equally clear that a majority of the participating states was against a maximum territorial limit of less than 6 miles. The main conflict of interest was in regard to jurisdiction over the outer zone between 6 and 12 miles. This, therefore, is the point on which we shall have to concentrate our efforts.

"The conference in 1958 demonstrated clearly that the interests of coastal states in regard to fishing extend much farther out than those of so-called noncoastal states. A majority, therefore, supported the idea of providing a wider limit for the fishing zone than for the territorial sea. In my opinion, it would be unwise if this fact were to be ignored by the present conference.

"On the basis of Norway's national interests, we would have preferred a maximum territorial limit of 3 to 4 miles. In our opinion, such an arrangement would also be the best for the world as a whole. We are aware, however, that a majority of the states will not accept a territorial limit of less than 6 miles, and we will, therefore, adhere to the concession we made on this point in 1958.

"As to the fishing zone, I wish to affirm that the Canadian proposal is in accord with the national interests of Norway. Technical developments in deep-sea fishing and the heavy increase in trawlers along the coast of North Norway have created very serious problems for our traditional fisheries. Opportunities for our coastal fishermen to fish in their traditional waters are becoming ever more limited, because their implements are destroyed and their ancient fishing banks wholly or partly occupied by foreign trawlers. People in the coastal districts of North Norway are completely dependent upon these fisheries. The fast growth of the foreign trawler fleet represents a new and threatening factor in their lives. They maintain this necessitates new rules, and the government sees no choice but to provide a 12-mile fishing zone with exclusive rights for the nation's fishermen. To give coastal fishermen a reasonable protection in exploitation of their traditional fishing grounds and use of their traditional implements is, in our view, an equitable way of balancing conflicting interests, not only along the Norwegian coast but in all parts of the world," concluded Norway's representative at the Conference. (News of Norway, April 14, 1960.)



Pakistan

PLANS FOR BUILDING NEW TRAWLERS CHANGED:

In December 1959, the Pakistan Government allocated Rs400,000 (about US\$85,000) towards the cost of 14 otter trawlers to be built outside of Pakistan. As of the latter part of April 1960, only one order had been placed.

The Government has now decided to have the trawlers built by the Karachi Shipyard and has reportedly asked the one licensee to try to cancel his order. Licenses are not being revoked, but the 14 licensees are being asked to use the foreign exchange to import components such as engines, refrigeration equipment, and deck gear. An additional 9 firms will be given licenses for the import of such components, according to an April 28 dispatch from the United States Embassy in Karachi.



Peru

ANCHOVY FISHERMEN RESUME TIE-UP:

After a 15-day negotiating period, Peruvian anchovy fishermen at the port of Callao on May 11 resumed the tie-up which began in mid-April and closed fish meal plants in Callao and other ports along the Peruvian coast. During the negotiations, 2 of 4 demands were met—a weekly rest day and increased allowances for meals. However, plant and vessel owners have refused to accord the fishermen a specified percentage of the price per ton for the formation of a fishermen's mutual association, the United States Embassy at Lima reported on May 13, 1960.

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EXPANSION OF FISHERIES RESEARCH EXPECTED IN 1960:

Fisheries research by Peru may be expected to gain impetus during 1960, if the program announced during the first quarter of 1960 by the Bureau of Fisheries and Hunting of the Ministry of Agriculture can be carried out. The three-fold program consists of an investigation of ocean resources, particularly bonito, the cultivation of fresh-water fish and crustaceans, and technical studies of quality control of fisheries products.

The Governing Council of the Special Fund of the United Nations has made available to Peru the sum of US\$1,374,300, part of which is to be used for the creation of a Marine Research Institute for the study and development of Peru's marine resources. There has been no indication as yet whether the balance of the United Nations fund will be used for the program announced by the Ministry, states an April 12, 1960, dispatch from the United States Embassy in Lima.

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EXPORTS OF FISHERY PRODUCTS, 1958-59:

Exports of frozen fish and shellfish, canned fish, and fishery byproducts by Peru in 1959 increased for all items except shrimp. Total exports of all fishery products increased by 140 percent in quantity and 152 percent in value as compared with 1958. Fish-meal exports of 277,600 metric tons in 1959 were up about 162 percent from the 105,777 tons exported in 1958. The more than tenfold jump in the exports of fish oil

Product	1959			1958		
	Quantity	Value/		Quantity	Value/	
	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000
Frozen Fish:						
Tuna	17,466	53.3	1,942	9,808	27.4	1,176
Skipjack tuna	7,928	23.9	871	6,073	17.4	747
Swordfish	347	4.4	160	335	3.4	146
Shrimp	88	2.0	73	228	4.5	193
Total frozen	25,829	83.6	3,046	16,444	52.7	2,262
Canned Fish:						
Bonito	16,745	174.2	6,346	12,541	116.2	4,987
Tuna	776	6.4	233	888	7.6	326
Total canned	17,521	180.6	6,579	13,429	123.8	5,313
Byproducts:						
Fish meal	277,600	860.5	31,348	105,777	271.1	11,635
Fish oil	17,165	44.7	1,628	1,643	4.5	193
Sperm oil	10,004	33.9	1,235	7,352	25.7	1,103
Whale meal	3,317	9.7	353	1,695	3.9	167
Total by-products	308,086	948.8	34,564	116,467	305.2	13,098
Total fishery products	351,436	1,213.0	44,189	146,340	481.7	20,673
1/7 c.b. value. The average exchange rate for U. S. dollar was 27.45 soles in 1959, and 23.30 soles in 1958.						

in 1959 indicates that in addition to increases in the supply of raw material there was an increase in the recovery of oil from the fish-meal operations. (U. S. Embassy in Lima, April 12, 1960.)

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FISH MEAL EXPORTS CONTINUED UPWARD TREND IN FIRST QUARTER OF 1960:

The continued expansion of Peru's fish-meal industry is indicated by data on fish-meal exports through the port of Callao for January-March 1960. During that period exports through Callao of 59,752 metric tons were up 190 percent from the 20,633 tons exported through that port in the same period of 1959. Exports of fish meal from Callao by months for 1960 (1959 in parentheses) were: January 15,607 tons (5,567 tons), February 26,668 tons (9,341 tons), and March 17,477 tons (5,725 tons).

Exports from Peru via Callao in 1959 accounted for about 40 percent of the total fish-meal exports. Reports from the fish-meal industry indicate that by the end of April this year stocks of fish meal on hand will be exhausted, as close to 60,000 tons of fish meal were scheduled for export in that month. The same sources estimated that Peru would produce 400,000 tons of fish meal in 1960,

Peru (Contd.):

the United States Embassy in Lima reported on April 12, 1960.

The plants located in the Lima-Callao area early this year were getting complaints from residents of the metropolitan area because of the odors coming from the plants and the Maritime Terminal Basin area (where water saturated with organic fish wastes is dumped). The closing of the offending plants in the Lima area by the end of April was agreed upon by the mayors of the municipalities affected. The plants had until April 15 to stop polluting the harbor area.

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REGULATIONS ON FISHING INDUSTRY ISSUED:

Pursuant to Supreme Decree No. 46 of December 5, 1959, issued by the Peruvian Ministries of Marine, Agriculture, and Labor and Indian Affairs, a special commission was appointed to study conditions in the Peruvian fishing industry, particularly relations between owners and operators of fishing vessels and fishermen. By Supreme Decree No. 6 of April 15, 1960, issued by the same agencies and published in El Peruano of April 16, a Project of Regulations for the Fishing Industry, prepared by the special commission, was approved and incorporated into the Regulations of Captainships and National Merchant Marine.

The Regulations consist of six Chapters and 74 Articles, which may be summarized as follows:

Chapter I: Control of vessels, ship owners and operators, and fishermen are under the jurisdiction of Captainships of Ports. Foreign fishing vessels may not operate in Peruvian waters without express permission. Defines fish according to location where caught. Captainships of Ports must assure the strict observation of regulations for the protection of fish and of guano birds. Only Peruvian citizens or resident foreigners may engage in hunting for whales, sea lions, etc., and in the elaboration of their products.

Chapter II: Defines categories of fishermen, obligations of each category, documents required, and how to obtain them.

Chapter III: Defines fishing vessels, registration requirements, equipment, etc.

Chapter IV: Obligations of ship owners and operators.

Chapter V: Defines the three types of work contracts under which fishermen are to work, and the rights and obligations of all vessel owners, operators, and fishermen under each type.

Chapter VI: Provides that all risks not covered by labor contracts may be covered by private insurance, mutual companies, cooperatives, etc. Where risks are covered by work contracts, pertinent labor and social welfare legislation is applicable.

The Regulations distinguish between three types of work contracts: Society, direct labor contract, and participation contracts in which members of vessel crews participate in the proceeds of the sales of the catch. Only under the direct labor contract system can fishermen obtain social security benefits provided by law for other industries

under the Caja Nacional de Seguro Social. Most fishermen are excluded from these benefits, and this includes the anchovy fishermen who work under the participation system. Therefore, the publication of the Regulations merely clarifies points already on the statute books, and does not help satisfy the demands of the anchovy fishermen, who were still tied-up as of April 26, states an April 26, 1960, dispatch from the United States Embassy in Lima.

Anchovy fishermen at Callao and Chimbote have been on strike since April 12, with anchovy fishermen at other ports joining the strike since its inception. They are demanding four benefits: (1) standard price of 80 soles (US\$2.89) a metric ton to be paid by ship owners or operators to fishermen; (2) increase from 80 to 100 soles (US\$2.17-3.51) per day for food for crews; (3) obligatory paid rest on Sunday; (4) creation of a Mutual Fund from which social security benefits would be obtained, by payment of 5 percent of salaries by operators, and another 5 percent share by the fishermen.

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SCHOOL FOR FISHING VESSEL CREWS ESTABLISHED:

The Peruvian Ministry of the Navy has created a fisheries school (La Escuela de Capacitacion de Pesca), which was opened at Chimbote on May 15, 1960. The teaching staff will be drawn largely from the Naval School, and its first objective will be to enable operators of fishing vessels to obtain professional masters' licenses, as required by the recently-issued Fishery Industries Regulations. Later, other courses will be offered for members of vessel crews, states a May 13, 1960, dispatch from the United States Embassy in Lima.



Philippines

IMPORT CLASSIFICATION CHANGED FOR SQUID (CUTTLEFISH):

In an April release by the Central Bank of the Philippines, squid (cuttlefish) was one of the commodities which was classified as a nonessential consumer item. Previously, squid was classified as a decontrolled item.

As a result, imports of this product into the Philippines will be adversely affected. As a decontrolled item, importers were able to secure dollar exchange without difficulty at a fixed rate of 2.5 pesos per US\$1. As a nonessential consumer item, the importer will have to pay the "free market" rate of 4.0 pesos per US\$1 for dollar exchange, and the amount available will be limited. Thus, not only has the cost of dollar exchange

Philippines (Contd.):

needed to import squid increased 60 percent, but also the quantity available is limited.

This change in classification may have a strong bearing on United States exports of canned squid. In the first quarter of 1960, United States exports to the Philippines were 3,924,000 pounds and represented 86 percent of the total United States trade in that product. In 1959, total United States exports of squid to the Philippines were 6,139,000 pounds. (Manila Bulletin, April 28, 1960.)



South-West Africa

FISHERY PRODUCTS VALUE
LOWER IN 1959:

The total value of fishery products produced in South-West Africa during 1959 is estimated to be about ± 8.4 million (US\$23.4 million) as compared with ± 9.3 (about US\$25.9 million) in 1958. The decline was due to a deliberately planned 25-percent reduction in the production of canned pilchards to help ease high inventories on hand at the beginning of the year.

The annual catch limit of 250,000 tons of pilchards was revised upwards to 260,000, but now includes maasbanker as well. A far more significant development was a subsequent decision by the Administration to temporarily increase the catch limit by a further 40,000 tons to a total of 300,000 tons for the year. This decision was taken to enable the six factories at Walvis Bay to step up production of fish meal to compensate for a declining market price for this product due to Peruvian competition. This additional tonnage of raw fish, coupled with a 25-percent cut back in output of canned fish, enabled the six Walvis Bay factories to turn out 60,852 tons of fish meal and 19,372 tons of fish oil in 1959 as compared with 46,200 tons and 12,381 tons respectively in 1958.

While the permanent annual limit on the catch of pilchards and maasbanker still remains at 260,000 tons, the Administration has again announced an increase in the limit for 1960 to a total of 310,000 tons or 50,000 tons above the limit.

South-West Africa's Production of Sardines (Pilchard) and Spiny Lobster Products, and White Fish Landings, 1958 and 1959		
Product	1959	1958
	.....(Short Tons). . . .	
Pilchards:		
Canned	41,943	58,422
Fish meal	60,852	46,200
Fish oil	19,377	12,381
	.....(1,000 Lbs.). . . .	
Spiny Lobster:		
Canned	502.7	430.3
Frozen tails	2,478.3	1,777.3
Meal	2,130.9	1,861.6
White fish	6,812.4	6,619.6

Carryover stocks of fish meal, oil, and canned fish from 1959 production by South-West Africa were negligible. According to estimates from the industry, the market for canned pilchards in 1960 looks promising. The Walvis Bay factories are therefore expected to step up production of canned pilchards to the 1958 level or higher.

During the early part of the year, spiny lobster boats at Luderitz were able to bring in substantial catches due to favorable weather conditions. This enabled the six factories in that port to increase production of canned and frozen spiny lobster tails by 35 percent over the 1958 figure. (Consulate General report, dated April 1, 1960, from Cape Town.)



Spain

ANCHOVY LANDINGS HEAVY
IN BILBAO AREA:

The anchovy fishing season in the Bilbao area of northern Spain, which opened on March 1, 1960, and ends May 31, is proving to be excellent this year. Large quantities of anchovies, canned in olive oil or salted, are being exported to the United States, Italy, and other countries. The supply is greater than the canneries can accommodate, with the result that prices have dropped to as low as 1.50 pesetas a kilogram (about 1.1 U. S. cents a pound) wholesale, and catches are being limited in accordance with instructions from the fishermen's syndicate. (United States Consulate dispatch from Bilbao, April 19, 1960.)

* * * * *

VIGO FISHERIES TRENDS,
JANUARY-MARCH 1960:

Fish Exchange: A total of 11,968 metric tons of fish were landed during the first three months of 1960, as compared with 23,260 tons for the previous quarter and 15,097 tons for the first quarter of 1959. The usual drop in fish catches during the first months of the year was sharper this year because of extremely unfavorable weather. Another factor was that the closed season for sardines started on February 15.

The total value of the landings for the first quarter of 1960 and the last quarter of 1959, calculated in U. S. dollars (at 60 pesetas to the dollar), was \$2,287,161 and \$3,197,017, respectively. For the first quarter of 1959 landings were valued at \$4,113,717 (at 42 pesetas to US\$1).

Landings during the first quarter of 1960 were: 3,218 metric tons of pomfret (1,757 tons for the fourth quarter and 4,069 tons for the first quarter of 1959); 2,498 tons of small hake (2,418 tons for the fourth quarter and 3,665 tons for the first quarter of 1959), and 1,198 tons of horse mackerel (2,228 tons for the fourth quarter and 1,590 tons for the first quarter of 1959). Sardine landings amounted to 1,083 tons (1,186 tons for the fourth quarter and 774 tons for the first quarter of 1959).

The average price per kilo for all fish at the Exchange during the first quarter of 1960 was 11.63 pesetas (8.8 U. S. cents a pound) as compared with 8.33 pesetas (6.3 U. S. cents a pound) in the fourth quarter and 11.58 pesetas (12.5 U. S. cents a pound) in the first quarter of 1959.

Spain (Contd.):

Landings of hake continued to drop, and amounted to only 85 tons as compared with 119 tons during the previous quarter and 180 tons during the first quarter of 1959. The average price per kilo during the quarter was 56.09 pesetas (42.5 U. S. cents a pound) as compared with 63.30 pesetas (48.0 U. S. cents a pound) for the previous quarter and 50.92 pesetas (55.1 U. S. cents a pound) for the first quarter of 1959.

Fish Canning and Processing: Canning activity during the first quarter of the year was at the annual low-point, and usually remains so until the beginning of the new albacore season in the late spring. Exports of last year's production continued at a high rate and compensated for reduced sales domestically. Domestic sales are estimated to have dropped 10 percent in January, 20 percent in February, and about 30 percent in March as compared with the same months in 1959. While this is not a general estimate for the whole fish canning industry, it does give an indication of the general situation. The new canning season is expected to begin without the substantial unsold stocks which caused general uneasiness in the canning industry during the early part of 1959.

Exports: Preliminary 1959 production figures for the Spanish fish canning industry indicate a decrease from 1958 levels, while data for the first 11 months of 1959 show an increase in the volume of exports over the same period in 1958. Production declined from 53,892 metric tons in 1958 to 50,376 tons in 1959, a drop of 5.4 percent. Exports for the first eleven months increased from 11,673 tons in 1958 to 13,084 tons in 1959—an increase of 11.2 percent. Exports of canned anchovies, sardines, tuna, and "other fish" increased in this period, except for anchovies which decreased from 6,532 tons in 1958 to 4,944 tons in 1959.

New Can Factory Proposed: A group of 13 Vigo fish packers, in conjunction with a French firm, have solicited approval from the Ministry of Industry for the establishment of a can factory in Vigo. The French firm will provide 45 percent of the 44 million pesetas (US\$733,333) of capital—partly in the form of foreign exchange and partly in machinery and equipment.

The production of the can company is estimated at 900,000 cases a year, with an estimated raw material consumption of 5,000 metric tons of tinsplate, 50 tons of tin, and 100 tons of lead. The tin and tinsplate will be imported and purchased domestically, while the lead will be acquired from domestic producers.

Most of the 13 canners participating in the project are of medium to large size in comparison with the rest of the industry. Some of the largest, and most successful, exporters are not among the participants.

Sardines: The two months off-season on sardine catches went into effect on February 15, 1960, and continued until April 15. Designed primarily as a conservation measure to prevent exhaustion of the species in coastal waters, the ban has been in effect for several years.

New Syndicate Tax Levied on Fish Shipments: A new fish tax levied by the Provincial Fish Syndicate of Pontevedra on fish shipped to the interior has been imposed retroactive to January 1, 1960. The tax, originally announced as 40 pesetas per metric ton (about 67 U. S. cents a metric ton) was subsequently changed to 4 pesetas (about 6.7 U. S. cents) a metric ton. As first announced the tax was to have covered all fish landed at provincial exchanges except fish for local consumption. The tax has since been amended to exclude fish for industrial purposes locally, and now includes only fish shipped to markets outside the Province. This category, however, includes approximately two-thirds of the volume of fish landed in the port of Vigo. Estimates of the yield in Vigo, adjusted for the lowered rate and the additional exceptions, run below 200,000 pesetas (US\$3,333) annually.

Cod: The largest of the three important cod companies in the northwestern region of Spain has recently initiated production in its new plant in La Coruna, and is thus com-

pleting the shift in the base of its operations from Vigo to La Coruna. This shift could eventually make the latter the most important fishing port in Spain, a position long held by Vigo. The new plant, said to be one of the largest in Europe, has a reported capacity to handle approximately 30,000 metric tons of cod a year, and expects to process 24,000 tons a year initially. The plant is equipped with cold-storage rooms with a capacity of 12,000 tons, and 12 Danish-built drying tunnels capable of handling 100 tons daily.

The new plant is modern and well laid-out, but according to advocates of the factoryship as the plant of the future for the Spanish fishing industry, the new plant is excessively costly and represents a retrogression for the Spanish cod industry. To date, Spain has no factoryships in operation, although the hull of a factoryship was recently launched by a shipyard near Bilbao. However, it is said to be a long way from completion.

Territorial Limits: Unilateral action by Ireland in redefining its territorial waters and the opening of the Geneva Conference on the Law of the Sea have brought the problem of fishing rights home to the Spanish industry. Ireland's decision to extend the three-mile limit to a line connecting salient points has closed off several areas along the western coast of Ireland previously fished by Spanish trawlers. This unilateral action, coming just a few months before the Geneva Conference, has been widely criticized in Spanish fishery publications.

Although adoption of a "six and six" formula by the Geneva Conference would prejudice current fishing rights enjoyed by the Spanish fleet, there is an inclination within the industry to regard this as the least harmful of the various alternatives which result from the conference. Such a solution is looked upon apprehensively, however, not only because of the exclusion of Spanish vessels from certain areas, but also because of the frictions that are regarded as inevitable in the policing of extended territorial waters. (United States Consular dispatch from Vigo, April 12, 1960.)



Sweden

FISH EXPORTS TO EAST GERMANY UNDER 1960 AGREEMENT:

The Swedish West Coast Fish organization in Goteborg has received an order from East Germany for fresh and frozen fish valued at 1,700,000 crowns (US\$328,100). The order, which provides for exports of frozen herring and fresh and frozen mackerel, is a supplement to the contract signed in January 1960.

The contract with East Germany at present calls for export of fish and fish products valued at 8,000,000 crowns (\$1,544,000) for deliveries during the first half of 1960. It is estimated that about 75 percent of the sales will come from the Swedish west coast.

Exports to East Germany are chiefly of herring, cod and other fish fillets. The amount of Swedish fish exports is based upon the volume of other trade between Sweden and East Germany as well

Sweden (Contd.):

as the supply of fish caught by Swedish fishermen.

In 1959, East Germany did not purchase fish and fish products for the 22.5 million crowns (\$4,342,500) provided in the global compensation arrangement and the value for the 1960 calendar year has therefore been fixed at 18 million crowns (\$3,474,000). In June or July this year it will be decided whether East Germany is going to purchase Swedish fish valued at 10 million crowns (\$1,930,000) for deliveries during the latter part of 1960. (United States Consulate dispatch from Goteborg, May 4, 1960.)



Tunisia

EXPORTS OF MARINE PRODUCTS AND SNAILS TO THE UNITED STATES, 1955-59:

Cuttlefish bone and snails were the principal marine and related products exported to the United States by Tunisia for 1955-1959. Other products included

about 44 tons, valued at \$35,000 in 1959. (United States Embassy in Tunis, May 2, 1960.)

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FISHERIES TRENDS, MARCH 1960:

In late March 1960, a Japanese fishing vessel called at the Tunisian port of Mahdia to supply Japanese-caught tuna to the canneries in that city. In 1959, the tuna catch in Tunisia was a failure with only 200 metric tons landed as compared to a normal year's catch of 1,000 tons. The lower cost of Japanese-caught tuna has again made possible the export of Tunisian canned tuna to France. Production costs of Tunisian-caught and canned tuna remain high and inhibit exports.

Further delays have occurred in the delivery of four International Cooperation Administration-financed trawlers being constructed in Italy for Tunisia's "Office National de Peche." It is now hoped that two trawlers will be delivered in June and two in August.

With the exception of a slight increase in the export of fresh fish, Tunisian fishery products exports showed further declines in 1959, although the total fish catch

Tunisia's Exports of Marine Products and Snails to United States, 1955-59

Product	Quantity					Value ^{1/}				
	1959	1958	1957	1956	1955	1959	1958	1957	1956	1955
	(Metric Tons)					(US\$1,000)				
Sponges	-	-	-	-	-	-	-	-	7	7
Cuttlefish bone	20	25	24	45	132	17	22	16	53	170
Snails ^{2/}	24	37	34	54	60	18	22	13	21	26
Octopus, dried	-	-	1	-	2	-	-	1	-	1
Sea shells	-	-	4	7	-	-	-	4	4	-
Total	44	62	63	106	194	35	44	34	85	204

^{1/}Values converted at rate of 0.420 dinar equals US\$1.

^{2/}Snail exports are probably live land snails which are commonly sold in some of the larger United States wholesale fish markets.

small quantities of sponges, dried octopus, and sea shells. From 1955 exports of all these products dropped from 194 metric tons, valued at US\$204,000, to a-

is believed to have increased. Dinar devaluation would likely have a beneficial effect in the stimulation of fishery products exports, but improved fish-handling

Tunisia's Exports of Marine Products, 1957-59

Product	VALUE					
	1959		1958		1957	
	1,000 Dinars	US\$1,000	1,000 Dinars	US\$1,000	1,000 Dinars	US\$1,000
Fresh fish	191	455	180	429	199	474
Salt, dry or smoked	22	53	40	96	39	94
Shellfish	77	183	188	447	107	256
Sponges	374	891	657	1,564	731	1,740
Prepared fish products	742	1,768	796	1,895	846	2,014
Total	1,406	3,350	1,861	4,431	1,922	4,578

Note: One dinar equals US\$2.381.

Tunisia (Contd.):

procedures, modernization of canneries, and reduced cost of the cans are required if the Tunisian fishing industry is to become truly competitive in the world market. (United States Embassy in Tunis, May 2, 1960.)



U.S.S.R.

ANTARCTIC WHALING FLEETS RETURN AFTER GOOD SEASON:

The Soviet whale factoryship Sovietskaya Ukraina and 19 catchers arrived in Montevideo, Uruguay, April 16, 1960, from the 1959/60 trip to the Antarctic. Soon after arrival the commanding officer called a press conference during which he expressed his satisfaction with the trip just terminated. He stated that the factoryship, which was recently completed, had a crew of 1,247 and that its construction cost of £3 million (US\$8.4 million) was more than offset by the profits (probably means gross value) from this trip which he estimated at £4 million (US\$11.2 million).

The Russian commander stated that 4,350 whales of various kinds were caught, and that the factoryship manufactured 38,600 tons of whale oil, 7,270 tons of fish meal, 2,140 tons of frozen meat suitable for animal feed, and 726 tons of frozen liver. He also said that his fleet caught more whales than any of the other whaling fleets competing in the Antarctic, among them Japanese, Norwegian, and British. He claimed that the other Soviet factoryship Slava had the second best fishing record during the season. (United States Embassy in Montevideo, April 20, 1960.)

* * * * *

FISHERIES LANDINGS INCREASED IN 1959:

Fisheries landings in the Soviet Union in 1959 were close to 6.8 billion pounds (3,064,000 metric tons) as compared with about 6.5 billion pounds (2,931,000 metric tons) in 1958, according to an article in the Soviet trade magazine Rybnoe Khozjajstvo (No. 1 issue for 1960) and

as reported in Fiskets Gang (April 7, 1960), a Norwegian fishery trade periodical.

The increase in landings in 1959 was at about the same level as the average increase during the 1954-58 period, or about 135,000 metric tons annually. If the increase continues at the same level for the remaining six years of the seven-year plan, the goal of the plan (4,626 million tons or about 10.2 billion pounds in 1965) will not be reached. Soviet authorities, however, expect to increase the annual level. For 1960 the plan's requirements have been increased 10 percent over the 1959 landings, that is 306,000 tons.

The Soviets did not meet the planned quota in 1959 by 40,000 tons. In the north-western area, the Estonian, the Lithuanian, Murmansk, and Archangel areas fulfilled their quotas--Murmansk by over 24,900 tons. The Latvian and the Kaliningrad areas, which are to be expanded to important ocean fishery bases, did not meet the plan's quotas.

The increased catch in 1960 will be taken by bringing new fishing areas into use. Fishing will not be intensified on the old fishing grounds which will tend to protect and increase the fishery reserves there. This is especially true in coastal and inner waters.

The demand of consumers for lean herring and certain other varieties of small fish is limited, so the catch of those species will be reduced significantly. In the North Atlantic the catch of small fish will be completely suspended, but the catch of ocean perch, cod, and flounders will be increased.

The fish-processing industry is confronted with great problems in 1960. Its production goal presupposes an increase of 7 percent and a more varied production will be required. Live fish, and iced and frozen fish must make up 23 percent of the total production. It is stated that the necessary technical equipment for such an expansion is at hand if utilized correctly. Smoked and dried fish are to constitute 4.6 percent of the production.

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U. S. S. R. (Contd.):

LITHUANIANS FISH
NEWFOUNDLAND BANKS:

Fifty fishing craft will be sent to the Newfoundland banks from Klaipeda (Memel), Lithuania in 1960 as compared with 11 last year, according to the March 11 issue of Sovjetskaja Litva. The vessels were due on the banks in April. The Lithuanians maintain that they have demonstrated that ocean perch can be fished profitably on the Newfoundland banks with medium-size vessels.

Defective equipment and insufficient training and experience of the crews meanwhile have continued to be serious problems.

The same periodical reports that BMRT-315 Sergej Esenin, Latvia's first large freezer trawler has returned to Riga from its second trip (December 23, 1959, to March 4, 1960). The vessel landed 550 metric tons of processed fish as compared with a planned quota of 420 tons. This included 60 tons of fish meal (planned quota 30 tons) and 15 tons of oil (planned quota 3 tons). The catch was taken on the Newfoundland banks. One drag took 20 tons of fish.

A BMRT vessel is a combination fishing craft, factory vessel, and freighter. It is equipped for filleting, processing of the waste into fish meal, manufacture of oil, freezing, and cold storage. At the end of March the BMRT-315 was scheduled to depart on its third trip. (Fiskets Gang, Norwegian fish trade periodical, April 14, 1960.)

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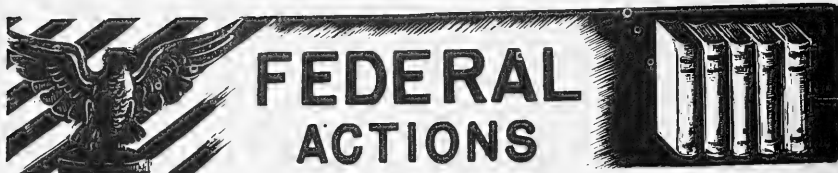
SEVEN-YEAR PLAN INCLUDES
EXPANSION OF FISH FREEZING:

Included in Russia's seven-year (1959-1965) plan for the development of quick-freezing facilities for many foods, is the threefold expansion of quick-freezing of fish. The plan calls for the production of 1,300,000 metric tons of frozen fish by 1965--900,000 tons to be frozen aboard vessels and 400,000 tons frozen ashore. This is three times the amount of fish frozen at present.

To aid in achieving the planned goal, the Soviet Union has one research Institute for quick-freezing which employs 65 technicians and 165 other workers. Many other well-equipped laboratories are also available. (Indust. Obst.-u. Gemuseverw., vol. 44, no. 19, Oct. 8, 1959, pp. 442-443.)

JAPANESE CAPTURE DOLPHIN AND PILOT WHALES FOR AQUARIUMS

At the port of Arari in Shizuoka Prefecture, Japan, famous for live captures of porpoise, a large school of pilot whales (blackfish) and bottle-nose dolphin appeared on June 10, 1960. With the regular season nearing its end, the fishermen of Arari had resigned themselves to having no "porpoise bonus" this year, but the advent of the big school, the first in 17 months, roused them to furious activity. On June 10 a total of 120 pilot whales and 50 bottle-nose dolphin were captured. Pilot whales are worth 6,000 yen (US\$17) each to aquariums, and the dolphin, which are the most talented of cetacean performers, bring 50,000 yen (\$140) each. Thus the day's catch was worth over 3 million yen (\$8,300) to the fishermen of Arari. (Nippon Suisan Shimbun, June 15, 1960.)



Federal Trade Commission

CRAB FISHERMEN'S ASSOCIATION DENIES CHARGES OF UNFAIR COMPETITION AND RESTRAINT OF TRADE:

A Westport, Washington, Association of crab fishermen and its officials, trustees, and fishermen members, have denied (Answer 7859, Crabs) Federal Trade Commission charges that they have illegally restrained competition in the Dungeness crab industry in their area.

Replying to the Commission's April 7, 1960, complaint, they state the association is a fishermen's cooperative organization operating under the Fisherman's Cooperative Marketing Act, which entrusts to the Secretary of the Interior exclusive jurisdiction for determining whether any such association monopolizes or restrains trade in interstate or foreign commerce.

The Commission, they declare, "is therefore without jurisdiction to proceed in this matter. The Department of the Interior has heretofore considered the same practices and acts herein complained of and determined that there is no evidence of any monopolistic practices unduly enhancing the price of crab."

A further contention is that under the Fisherman's Cooperative Act the Association and its members are immune from civil proceedings based on the antitrust laws in the absence of any allegation they have entered into transactions with persons or organizations not accorded immunity under the statute.

The respondents deny Commission charges that they have used threats of reprisals, intimidation, and physical violence and other coercive methods in a conspiracy to prevent other dealers from buying or selling processed and unprocessed crabs and to get nonmember crab fishermen to join the association.

The association admits the "Membership Agreement" gives it the power to determine the canners and crab processors with whom it and the members will deal. However, it denies the Commission's allegation that its main function is to fix prices paid by canners to members for their catch, which is taken from the coastal waters of Washington and Oregon and the adjacent ocean.

The members account for "a majority" of the fresh crabs originating in the former State, not "almost all" as the complaint alleged, the answer says. Similarly, it states, the association's total membership is about 180 fishermen, not 250; and 50 members, not 90, formed a cooperative known as Washington Crab Producers, Inc., and bought a crab processing cannery which competes with all other crab processors and canners.

The respondents further deny charges that (1) they have actual or potential power to monopolize all phases of the crab industry in their area because substantially the same men control the crab fishing fleet through the association, and own or control the cannery cooperative, and (2) this monopoly power, coupled with the coercive tactics allegedly employed, tends to unlawfully destroy competition in the industry.

Joining in the answer to the complaint are the trustees or officers of the association who act as representatives of the entire membership.

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SHRIMP PROCESSING MACHINERY FIRM CHARGED WITH SUPPRESSING COMPETITION:

The Federal Trade Commission issued charges on May 19, 1960, that a New Orleans, La., partnership has un-

lawfully achieved a virtual monopoly in the shrimp-processing machinery business, and suppressed competition in the \$16-million-a-year shrimp industry (Complaint 7887, Shrimp.)

Joined in the Commission's complaint are the firm's 6 active partners, who also are cited as representative of the approximately 26 limited partners; and a packing company of Houma, La., which is a silent partner and also is owned and controlled by members of the family owning the New Orleans shrimp-processing machinery firm.

The machinery firm leases, licenses, and sells shrimp-processing machinery, including peelers, cleaners, graders, de-veiners, and separators. The Houma packing company is one of the nation's largest processors of raw shrimp, which is taken primarily from the Gulf Coast fishing area, the complaint says.

Prior to 1947, it continues, shrimp was picked by hand labor. In that year two of the partners received a U. S. patent for a peeling machine, and since that time the New Orleans machinery firm has obtained ownership or control of numerous additional patents on processing machinery. Due to the efficiency of these machines, domestic shrimp processors must use them in their plants in order to compete in the market.

The complaint charges that the New Orleans machinery firm and its predecessor company have used these typical unfair methods of competition in interstate and foreign commerce: (1) entering into agreements with patentees and prospective patentees, thus obtaining exclusive rights to processing machines; and in most instances never attempting to manufacture, develop, or commercially exploit such machinery; (2) acquiring from inventors rights to all their future inventions in this field; (3) filing patent infringement suits against manufacturers and users of a competitive peeler developed by a New Orleans inventor and patented by him in 1957; and offering unfair selling terms to purchasers and prospective purchasers of this machine located in foreign countries; (4) requiring licensees to buy a certain number of the firm's debentures at \$500 each,

most of which do not become payable until 1966; and (5) charging licensees in Oregon, Washington, and Alaska discriminatory and much higher rates than those granted to licensees in other states.

The complaint further charges that the New Orleans machinery firm and the Houma packing firm have combined in carrying out these unfair practices, which have had the following adverse effects, among others: the New Orleans machinery firm has acquired a virtual monopoly in the domestic shrimp-processing machinery market; its competitors and potential competitors have been hindered in their business; inventors and potential inventors have been deterred in the distribution and marketing of their machines; shrimp processors in competition with the Houma packing firm have been injured, and a tendency toward monopoly in the shrimp industry has occurred.

The respondents were granted 30 days in which to file answer to the complaint.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

PROPOSED ADDITION TO LIST OF SPICES, SEASONINGS, ETC., RECOGNIZED AS SAFE:

The U. S. Food and Drug Administration proposes to add to the list of spices, seasonings, essential oils, etc. recognized as safe and exempt from the requirement of tolerances. The additional list includes about 82 spices and other natural seasonings and flavorings, essential oils, oleoresins, and natural extractives. Included in the list are such items as chervil, thyme, sage, lemon peel, ambergris, algae, dulse, etc. The common name and botanical name of plant source is given in the list. The proposed additions were listed in the Federal Register of May 19, 1960. Interested persons were given 30 days from the date of publication to file written comments on the proposal.

In the January 19 issue of the Federal Register, a list of about 70 spices and other natural seasonings and flavorings; 128 essential oils, oleoresins, and natural extractives; and 3 miscellaneous additives were listed by the Food and Drug Administration as safe for intended use, within the meaning of the Federal Food, Drug, and Cosmetic Act. The May 19 proposal would add to the January 19 list.

Those interested in complete details should write directly to the Food and Drug Administration, Washington 25, D. C.



Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

QUALITY STANDARDS ESTABLISHED FOR FROZEN SALMON STEAKS:

Voluntary standards for the production of high-quality frozen salmon steaks

became effective May 5 when they were published in the Federal Register of that date. Notice of intention to establish the salmon steak standards was carried in the Federal Register on February 27, 1960.

The standards were developed by the U. S. Bureau of Commercial Fisheries in cooperation with the fishing industry. Public meetings were held in Seattle, Wash.; Chicago, Ill.; and New York City, N. Y. Firms adopting the standards and the accompanying inspection may mark the product "U. S. Grade A" or "U. S. Grade B"—both designated good-quality merchandise.

The Bureau of Commercial Fisheries, with the help of the fishing industry, has already established quality standards for frozen fried fish sticks, raw frozen breaded shrimp, frozen raw halibut steaks, frozen haddock fillets, cod fillets, raw breaded portions, and frozen fish blocks.

The Bureau reports that there are now 32 processors with continuous inspection service.

Title 50—WILDLIFE

Chapter I—Fish and Wildlife Service, Department of the Interior

SUBCHAPTER K—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 178—UNITED STATES STANDARDS FOR GRADES OF FROZEN SALMON STEAKS

On page 1730 of the FEDERAL REGISTER of February 27, 1960, there was published a notice and text of a proposed new Part 178 of Title 50, Code of Federal Regulations. The purpose of the new part is to issue United States Standards for Grades of Frozen Salmon Steaks under the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e).

Interested persons were given until March 26, 1960, to submit written comments, suggestions or objections with respect to the proposed new part. No comments, suggestions or objections have been received, and the proposed new part is hereby adopted without change and is set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Dated: April 29, 1960.

ELMER F. BENNETT,
Acting Secretary of the Interior.

PRODUCT DESCRIPTION, STYLE, AND GRADES

- Sec. 178.1 Product description.
178.2 Style of frozen salmon steaks.
178.3 Grades of frozen salmon steaks.

DIMENSIONS

- 178.6 Recommended dimensions.

FACTORS OF QUALITY AND GRADE

- Sec. 178.11 Ascertaining the grade.

DEFINITIONS

- 178.21 Definitions.

LOT CERTIFICATION TOLERANCES

- 178.25 Tolerances for certification of officially drawn samples.

SCORE SHEET

- 178.31 Score sheet for frozen salmon steaks.

PRODUCT DESCRIPTION, STYLES, AND GRADES

§ 178.1 Product description.

Frozen salmon steaks are clean, wholesome units of frozen raw fish flesh with normally associated skin and bone and are 2.5 ounces or more in weight. Each steak has two parallel surfaces and is derived from whole or subdivided salmon slices of uniform thickness which result from sawing or cutting dressed salmon perpendicularly to the axial length, or backbone. The steaks are prepared from either frozen or unfrozen salmon (*Oncorhynchus* spp.) and are processed and frozen in accordance with good commercial practice and are maintained at

temperatures necessary for the preservation of the product. The steaks in an individual package are prepared from only one species of salmon.

(a) *Species*. Frozen salmon steaks covered by this standard are prepared from salmon of any of the following species:

- Silver or coho (*O. kisutch*).
- Chum or keta (*O. keta*).
- King, chinook, or spring (*O. tshawytscha*).
- Red, sockeye (*O. nerka*).
- Pink (*O. gorbuscha*).

§ 178.2 Styles of frozen salmon steaks.

(a) *Style I—Random weight pack*. The individual steaks are of random weight and neither the individual steak weight nor the range of weights is specified. The steaks in the lot represent the random distribution cut from the head to tail of a whole dressed salmon.

(b) *Style II—Random weight combination pack*. The individual steaks are of random weight and neither the individual steak weight nor range of weights is specified. The steaks in the lot represent a combination of cuts from selected parts of the whole dressed salmon.

(c) *Style III—Uniform weight or portion pack*. All steaks in the package or in the lot are of a specified weight or range of weights.

§ 178.3 Grades of frozen salmon steaks.

(a) "U.S. Grade A" is the quality of frozen salmon steaks that possess good flavor and odor, and that for those factors which are rated in accordance

with the scoring system outlined in the following sections the total score is not less than 85 points.

(b) "U.S. Grade B" is the quality of frozen salmon steaks that possess at least reasonably good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections the total score is not less than 70 points.

(c) "Substandard" is the quality of frozen salmon steaks that fail to meet the requirements of the "U.S. Grade B."

DIMENSIONS

§ 178.6 Recommended dimensions.

(a) The recommended dimensions of frozen salmon steaks are not incorporated in the grades of the finished product since dimensions, as such, are not factors of quality for the purpose of these grades. However, the degree of uniformity of thickness among units of the finished product is rated since it is a factor affecting the quality and utility of the product.

(b) It is recommended that the thickness (smallest dimension) of individually frozen salmon steaks be not less than ½ inch and not greater than 1½ inches.

FACTORS OF QUALITY AND GRADE

§ 178.11 Ascertaining the grade.

The grade is ascertained by observing the product in the frozen, thawed, and cooked states and is determined by consideration of the following:

(a) *Factors rated by score points.*
The quality of the product with respect to all factors is scored numerically. Cumulative point deductions are assessed for variations of quality for the factors in accordance with the schedule in Table I, in the frozen, thawed, and cooked states. The total deduction is subtracted from the maximum possible score of 100 to obtain the "product score."

(b) *Factors governed by "limiting rule".* The factors of flavor and odor, in addition to being rated by score points, are further considered for compliance with the "limiting rule" grade requirements of flavor and odor in Table I, as defined under Definitions § 178.21(g) (9) and (10).

Determination of the final product grade. The final product grade is derived on the basis of both the "product score" and the "limiting rule" grade requirements of flavor and odor, per Table I.

DEFINITIONS

§ 178.21 Definitions.

(a) "Slight" refers to a defect that is scarcely noticeable and may not affect the appearance, the desirability, and/or eating quality of the steaks.

(b) "Moderate" refers to a defect that is conspicuously noticeable (not seriously objectionable) and does not seriously affect the appearance, desirability and/or eating quality of the steaks.

(c) "Excessive" refers to a defect that is conspicuously noticeable (seriously objectionable) and seriously affects the appearance, desirability, and/or eating quality of the steaks.

(d) "Occurrence" is defined as each incidence of the same or different types of defects.

(e) "Cooked state" means that the thawed, unseasoned product has been heated within a boilable film-type pouch by immersing the pouch with product in boiling water for 10 minutes. Steaks cooked from the frozen state may require about two additional minutes of cooking.

(f) "Actual net weight" means the weight of the salmon steaks within the package after removal of all packaging material, ice glaze or other protective coatings.

(g) "Scored factors" (Table I):

(1) "General appearance defects" refers to poor arrangement of steaks, distortion of steaks, wide variation in shape between steaks, greater than normal number of head and/or tail pieces, imbedding of packaging material into fish flesh, inside condition of package, frost deposit, excessive or non-uniform skin glaze, and undesirable level of natural color.

(2) "Dehydration" refers to the appearance of a whitish area on the surface of a steak due to the evaporation of water or drying of the affected area.

(3) "Uniformity of thickness" means that steak thickness is within the allowed ½-inch manufacturing tolerance between the thickest and thinnest parts of the steaks within a package or sample unit.

(4) "Uniformity of weight and minimum weight" is defined in Table I. (Portions are designated by "weight range" or "specified weight." The "weight range" of portions bearing "specified weight" designation on containers shall be taken as the "specified weight" plus or minus 0.5 ounce unless otherwise specified.)

(5) "Workmanship defects" refers to appearance defects that were not eliminated during processing and are considered objectionable or poor commercial practice. They include the following: Blood spots, bruises, cleaning (refers to inadequate cleaning of the visceral cavity from blood, viscera and loose or attached appendages), cutting (refers to irregular, inadequate, unnecessary, or improper cuts and/or trimming), fins, foreign material (refers to any loose parts of fish or other than fish origin), collar bone, girdle (refers to bony structure adjacent to fin), loose skin, pug marks, sawdust and scales.

(6) "Color defects":

(i) "Discoloration of fat portion" means that the normal color of the fat

TABLE I—SCHEDULE OF POINT DEDUCTIONS FOR FACTORS RATED BY SCORE POINTS¹

Scored factors	Description of quality variation	Deduct
FROZEN		
1. General appearance defects.....	Per occurrence: Slight..... Moderate..... Excessive.....	1-2 3-4 5-10
2. Dehydration.....	(Per occurrence) for each 1 sq. inch of surface area. For each ½ inch above ¼" variation tolerance in steak thickness (max. deduction: 6 points).	2
3. Uniformity of thickness.....	Spice ¼-1/8 random weight. For each steak be- tween 2.5 and 3.0 ounces in weight per package, or per pound of product for packages over 1 pound net wt.	4
4. Uniformity of weight and minimum weight.....	Style III—Uniform weight or portion. For each 0.1 ounce beyond the 0.1 ounce tolerance of the specified portion weight range per 5 lbs. of prod- uct.	1
THAWED		
5. Workmanship defects: Blood spots, bruises, cleaning, cutting, fins, foreign material, collar- bone, girdle, loose skin, pug marks, sawdust, scales.....	Per occurrence: Slight..... Moderate..... Excessive.....	1 2-3 6-8
6. Color defects:		
(a) Discoloration of fatty portion.....	Slight..... Moderate..... Excessive.....	1-2 3-5 6-10
(b) Discoloration of lean portion.....	Slight..... Moderate..... Excessive.....	1-2 3-5 6-10
(c) Non-uniformity of color.....	Slight..... Moderate..... Excessive.....	1-2 3-5 6-8
7. Honeycombing.....	Percent sample area affected: 26 to 75..... 61 to 75..... 75 to 100.....	1 2 3
COOKED		
8. Texture defect (tough, dry, fibrous, or watery).....	Slight..... Moderate..... Excessive.....	1-2 3-5 6-10
9. Odor.....	Good (A)..... Reasonably good (B)..... Substandard (S).....	0-2 3-5 6-15
10. Flavor: ²		
(a) Lean portion.....	Good (A)..... Reasonably good (B)..... Substandard (S).....	0-2 3-5 6-15
(b) Fatty portion.....	Good (A)..... Reasonably good (B)..... Substandard (S).....	0-2 3-5 6-15

¹ This schedule of point deductions is based on the examination of sample units composed of: (a) An entire sample package and its contents (for retail sized packages) or (b) a representative subsample consisting of about one pound of salmon steaks taken from each sample package (for institutional sized packages), except that the entire sample package or its equivalent shall be examined for factor 4.

² "Limiting rule" grade requirements of flavor and odor: Salmon steaks which receive over 5 deduction points for color, or flavor of the lean, or flavor of the fatty portion, and those which receive between 3 to 5 points shall not be graded above "U.S. Grade B," regardless of the total product score. (This is a "limiting rule" based on flavor and odor as defined under Definitions § 178.21(g) (9) and (10)).

shows increasing degrees of yellowing due to oxidation.

(ii) "Discoloration of lean portion" means that the normal surface flesh color has faded or changed due to deteriorative influences.

(iii) "Non-uniformity of color" refers to noticeable differences in surface flesh color on a single steak or between adjacent steaks in the same package or sample unit. It would also include color variation of the visceral cavity and skin watermarking.

(7) "Honeycombing" refers to the visible appearance on the steak surface of numerous discrete holes or openings of varying size.

(8) "Texture defect" refers to an undesirable increase in toughness and/or dryness, fibrousness, and watery nature of salmon examined in the cooked state.

(9) "Odor" and "flavor:"

(i) "Good flavor and odor" (essential requirement for Grade A) means that the fish flesh has the good flavor and odor characteristic of the indicated species of salmon, and is free from

rancidity and from off-flavors and off-odors.

(ii) "Reasonably good flavor and odor" (minimum requirement for Grade B) means that the fish flesh may be somewhat lacking in the good flavor and odor characteristics of the indicated species of salmon, is reasonably free of rancidity, and is free from objectionable off-flavors and off-odors.

(iii) "Substandard flavor and odor" (substandard grade) means that the flavor and odor fail to meet the requirements of "reasonably good flavor and odor."

LOT CERTIFICATION TOLERANCES

§ 178.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified on the basis of Part 170 of this chapter (Regulations Governing Processed Fishery Products, 23 F.R. 5064, July 3, 1958).

SCORE SHEET

§ 178.31 Score sheet for frozen salmon steaks.

Label:
 Size and kind of container:
 Container mark or identification:
 Size of lot:
 Number of packages per master carton:
 Size of sample:
 Number of steaks per container:
 Product style:
 Actual net weight: (ounces)..... (lb.)

Scored factors	Deductions
FROZEN	
1. General appearance defects.....
2. Dehydration.....
3. Uniformity of thickness.....
4. Uniformity of weight.....
THAWED	
5. Workmanship defects.....
6. Color defects.....
7. Honeycombing.....
COOKED	
8. Texture.....
9. Odor (Limiting rule—Table I).....
10. Flavor (Limiting rule—Table I).....
Total deductions.....
Product score (100—Total deductions).....
Flavor and odor rating.....
Final grade.....

Note: Also see Commercial Fisheries Review, April 1960 p. 74.

* * * * *

VOLUNTARY GRADE STANDARDS PROPOSED FOR FROZEN RAW HEADLESS SHRIMP:

Frozen raw headless shrimp voluntary grade standards are proposed by the U. S. Bureau of Commercial Fisheries. The regulations are proposed for adoption in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended. Functions under that Act pertaining to fish, shellfish, and any products thereof were transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1958.

The proposed standards (published in the Federal Register of May 7, 1960), if recommended to the Secretary of the Interior for adoption and made effective, will be the first issued by the Department prescribing voluntary grade standards for frozen raw headless shrimp.

The proposed standards include product description, grades, sizes; factors of quality and grade, including ascertaining the grade; definitions; lot certification tolerance; and score sheet.

The frozen raw headless shrimp are described as clean, wholesome, headless, shell-on shrimp of the regular commercial species. They are sorted for

size, packed, and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product. Four different grades will be established: (1) "U. S. Grade A" or "U. S. Fancy"; (2) "U. S. Grade B" or "U. S. Good"; (3) "U. S. Grade C" or "U. S. Commercial"; and (4) "Substandard." The size categories as listed in the proposed standards are: under 10 count, 10-15 count, 16-20 count, 21-25 count, 26-30 count, 31-35 count, 36-42 count, 43-50 count, 51-60 count, 61-70 count, and over 70 count. Count is the number of shrimp per pound.



Eighty-Sixth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to Committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.



ALASKA FISHERIES: Arctic Wildlife Range--Alaska (Hearings before the Merchant Marine and Fisheries Subcommittee of the Committee on Interstate and Foreign Commerce, United States Senate, 86th Congress, Second Session, on S. 1899, a bill to authorize the establishment of the Arctic Wildlife Range, Alaska, and for other purposes, October 20, 22, 24, 26, 27, 28, 29, 30, 31, 1959, and April 22, 1960. Part 2--Ketchikan, Juneau, Anchorage, Seward, Cordova, Valdez, and Fairbanks, Alaska), 457 pp., printed. Contains statements, letters, telegrams, and resolutions of various citizens, clubs, and various Federal Government and state officials, on the establishment of the Wildlife Range by the Federal Government. A statement by the assistant librarian of the Alaska Historical Library refers to the fisheries management of the U. S. Fish and Wildlife Service before Alaska became a state with particular reference to the conservation of the king salmon. The statement of an Alaskan state senator gives a brief history of the salmon industry since the year 1925. Also contains and refers to the 1949 edition, Code of Federal Regulations, title 50, "Wildlife," subpart C, "Taking of Wildlife," a section of which is entitled "Public Fishing."

AREA ASSISTANCE ACT OF 1960: S. 3569 (Dirksen, for himself and Bush, Beall, Keating, Morton, and Javits), a bill introduced on May 18, 1960, to establish a program of financial and technical assistance designed to alleviate conditions of substantial and persistent unemployment in economically depressed areas, and for other purposes; to the Committee on Banking and Currency. This legislation is introduced to replace the Area Assistance Bill (S. 722) which was vetoed by the President on May 13, 1960, but without those features that the President found objectionable. An identical bill H. R. 12286 (Widnell), and three similar bills H. R. 12290 (Van Zandt), H. R. 12291 (Fenton), and H. R. 12298 (Saylor) were introduced in the House on the same date. H. R. 12490 (Siler), identical to S. 3569, was introduced in the House on June 1, 1960.

CHEMICAL PESTICIDES COORDINATION ACT: On May 26, 1960, the Committee on Merchant Marine and Fisheries met in executive session and ordered favorably reported to the House a clean bill, H. R. 12419, in lieu of H. R. 11502, to provide for advance consultation with the Fish and Wildlife Service and with state wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls. H. R. 12419 (Wolf), was the Committee bill, which was introduced in House on May 26; H. R. 12463 (King of Utah) was introduced in House on June 1, 1960, similar to H. R. 11502; both were referred to the Committee on Merchant Marine and Fisheries.

H. R. 12419 was reported out by the Committee on Merchant Marine and Fisheries on June 9, 1960 (H. Rept. 1786), and referred to the Committee of the Whole House on the State of the Union.

H. Rept. 1786, Providing for Advance Consultation Before the Beginning of any Federal Program Involving the Use of Pesticides or Other Chemicals (June 6, 1960, 86th Congress, Second Session, Report from the Committee on Merchant Marine and Fisheries to accompany H. R. 12419), 6 pp..

printed. The purpose of the legislation is to increase protection to wildlife from the use of pesticides and chemicals used for the control of agricultural pests. This would be achieved by a requirement that, before a program involving the use of chemical insecticides, herbicides, fungicides, rodenticides, or other chemicals be initiated or financed by the Federal Government, the initiating agency be required to inform the U. S. Fish and Wildlife Service and to consult with that Service with a view toward minimizing the adverse effect of the program on fish and wildlife resources. Report discusses purpose and need of legislation; presents the reports on the bill submitted by the departments of Agriculture, Interior, and Health, Education, and Welfare. Committee reported favorably on the bill without amendment.

The Senate Committee on Interstate and Foreign Commerce on June 16, 1960, submitted Rept. No. 1601 on S. 3473 (Magnuson) introduced in Senate May 3, 1960, similar to H. R. 12419. A committee amendment substituted the text of H. R. 12419.

COLOR ADDITIVES IN FOOD: On May 9, 1960, the House Committee on Interstate and Foreign Commerce concluded hearings on H. R. 7624, a bill to protect the public health by amending the Federal Food, Drug, and Cosmetic Act so as to authorize the use of suitable color additives in or on foods, drugs, and cosmetics, in accordance with regulations prescribing the conditions (including maximum tolerance) under which additives may be safely used. H. R. 7624 (Harris) introduced in the House on June 9, 1959, was reported out by the Committee on Interstate and Foreign Commerce on June 7, 1960 (H. Rept. 1761).

H. Res. 599 (Delaney), introduced in the House on June 14, a resolution for the consideration of and 2 hours debate on, H. R. 7624; resolution reported out without amendment (H. Rept. No. 1867).

H. Rept. No. 1761, Color Additive Amendments of 1960 (June 7, 1960, 86th Congress, Second Session, Report of the Committee on Interstate and Foreign Commerce, U. S. House of Representatives, to accompany H. R. 7624), 97 pp., printed. This legislation is to protect the public health by amending the Food, Drug, and Cosmetic Act so as to authorize the use of suitable color additives in or on foods, drugs, and cosmetics, in accordance with regulations prescribing the conditions (including maximum tolerances) under which such additives may be safely used. The report gives committee amendments, purpose and a general summary of the legislation, background information on coal-tar and other colors, need for legislation, a detailed explanation of the committee bill and a section by section analysis, changes in existing law, and reports of executive departments and agencies.

COMMERCIAL FISHING INDUSTRY STAMPS: S. 3624 (Mrs. Smith), a bill to provide a special series of postage stamps to be known as Commercial Fishing Industry Stamps, introduced in the Senate on June 6, 1960, and referred to the Senate Committee on Post Office and Civil Service. The purpose of the bill is to acquaint the people with the importance of the commercial fishing industry in the United States by having the Postmaster

General issue, as early as practicable in the calendar year 1960, a special series of 4-cent postage stamps of an appropriate design, which would be known as Commercial Fishing Industry Stamps.

CONSERVATION OF FISH AND SHELLFISH:

H. J. Res. 705 (Pelly), a joint resolution introduced in the House on May 10, 1960, to promote the conservation of ocean fish and shellfish; to the Committee on Ways and Means. Identical to S. J. Res. 184, which was introduced in the Senate on April 7, 1960.

EXEMPTION FROM REGULATION OF TRANSPORTATION OF BULK COMMODITIES BY RAILROAD: S. 3618 (Magnuson) introduced in Senate June 6, 1960, a bill to amend the Interstate Commerce Act, as amended, so as to provide that the transportation of bulk commodities by railroad shall be exempt from regulation. The purpose of the bill is to provide that the transportation of commodities in bulk, shall be accorded exemption from regulation similar to, but broader than, the exemption now granted water carriers subject to the Interstate Commerce Act.

EXEMPT RAILROAD TRANSPORTATION FOR FISH, LIVESTOCK, AND AGRICULTURAL COMMODITIES: H. R. 12413 (Rostenkowski), introduced in House on May 26, 1960, a bill to amend the Interstate Commerce Act, as amended, so as to extend to the railroads a conditional exemption from economic regulation comparable to that provided for motor carriers engaged in the transportation of ordinary livestock, fish, or agricultural commodities; to the Committee on Interstate and Foreign Commerce. At the same time H. R. 12414 (Rostenkowski) was also introduced in the House, a bill to provide for the economic regulation of certain motor vehicles heretofore conditionally exempt therefrom under the provisions of section 203(b) (6) of the Interstate Commerce Act, as amended, and for other purposes; to the Committee on Interstate and Foreign Commerce. These two bills have objectives which clash; but Congressman Rostenkowski offered them in order that Congress would choose one in order to eliminate the inequality of treatment for different modes of transportation as far as fish, livestock, and agricultural commodities are concerned.

FEDERAL WATER POLLUTION CONTROL

ACT: S. 3574 (Case of South Dakota), a bill introduced in the Senate on May 19, 1960, to strengthen the enforcement provisions of the Federal Water Pollution Control Act and extend the duration of the authorization of grants for State water pollution control programs, and for other purposes; to the Committee on Public Works. This legislation would make the following changes in the Federal Water Pollution Control Act: Extend, for an additional 5 years, the provision for Federal grants to State and Interstate water pollution control agencies for administration of their programs; make it possible for several communities to get individual Federal grants and use these funds in the construction of sewage treatment facilities; make all interstate navigable waters and coastal waters subject to Federal abatement enforcement authority whether or not there is a showing of interstate pollution if abatement action is requested by a State or municipality with the concurrence of the State,

and authorize the Secretary of Health, Education, and Welfare to issue final orders in enforcement actions; make discharges from Federal installations subject to administrative findings and recommendations in Federal water pollution abatement actions conducted by the Department of Health, Education, and Welfare; also includes a clarifying amendment in section 12, which preserves existing functions of other Federal agencies in the water pollution control field. Identical bills were introduced in the House: May 19, 1960, H. R. 12309 (Schwincloss), and on May 23, 1960, H. R. 12343 (Schwengel).

FISH AND WILDLIFE COOPERATIVE RESEARCH TRAINING UNITS: On May 26, 1960, S. 1781 (in lieu of H. R. 5814), a bill to provide for cooperative unit programs of research, education, and demonstration between the Federal Government of the U. S., colleges and universities, the several States and territories, and private organizations, was considered in executive session of Committee on Merchant Marine and Fisheries and ordered favorably reported to the House without amendment. On June 9, the House Committee on Merchant Marine and Fisheries submitted Rept. No. 1783 on S. 1781, referred to the Whole House on the State of the Union.

H. Rept. 1783, Authorizing Continuance of Cooperative Unit Programs of Research and Education Relating to Fish and Wildlife (June 9, 1960, 86th Congress, Second Session, Report from the Committee on Merchant Marine and Fisheries to accompany S. 1781), 4 pp., printed. The purpose of the bill is to continue the development of cooperative units by the Federal Government, states, educational institutions, and nonprofit organizations for research and training programs in the field of fish and wildlife resources. At present, such programs are maintained in some 16 states and a very considerable part of their work is the education of men and women to augment the number of trained people required for the proper conduct of the manifold activities required to maintain and develop our fish and wildlife resources. Report discusses need and cost of legislation and presents the Interior Department Report on the bill. Committee reported favorably on the bill without amendment.

FISHERIES ASSISTANCE ACT OF 1959: On May 5, 1960, Senator Lausche filed a motion in the Senate to reconsider action of the Senate taken on May 3, in adopting conference report on H. R. 5421, a bill to provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes.

On May 10, 1960, the House returned to the Senate in accordance with motion entered on May 5 by Senator Lausche, H. R. 5421 (with accompanying papers).

Pursuant to unanimous-consent request of June 6, 1960, the Senate adopted the Lausche motion to reconsider by vote the conference report on H. R. 5421. On reconsideration of this action the Senate by a 59-26 majority, again adopted the conference report.

By unanimous consent, Senate agreed that after action on June 7 on S. 2584, a bill to provide a 5-year program of assistance to enable depressed segments of the fishing industry in the United States to regain a favorable economic status, and for other purposes, it would consider motion of Senator Lausche, filed on May 5, 1960, to reconsider vote by which conference report was adopted in Senate on May 3 on H. R. 5421, to be considered under debate-limitation agreement. Senator Lausche opposed this legislation because in the House version of the bill a new principle is created under which subsidies are to be given to an industry which has been denied tariff relief by the President.

On June 8, 1960, the conference report on H. R. 5421 was adopted by the House, and thus cleared the bill for Presidential consideration. The bill as reported out by the conferees contains the following principal features: (1) a fishing vessel subsidy of up to one-third the cost of construction, if built in a U. S. shipyard under approval of the Department of Defense; (2) the Federal subsidy shall be \$2.5 million per year for 3 years; (3) eligible are those building vessels operated in a fishery for which escape clause relief had been recommended by the Tariff Commission but denied under the Trade Agreements Assistance Act and to certain fisheries found by the Secretary of the Interior to be injured by increased imports of fish or shellfish products.

On June 9, 1960, the Senate received message from the House that H. R. 5421 had been signed by the Speaker.

On June 10 the Committee on House Administration presented to the President, for his approval, H. R. 5421. The bill was signed by the President on June 12, 1960 (P. L. 86-516).

Public Law 86-516
86th Congress, H. R. 5421
June 12, 1960

AN ACT

To provide a program of assistance to correct inequities in the construction of fishing vessels and to enable the fishing industry of the United States to regain a favorable economic status, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to assist certain depressed segments of the fishing industry the Secretary of the Interior is hereby authorized to pay in accordance with this Act a subsidy for the construction of fishing vessels in the shipyards of the United States.

Sec. 2. Any citizen of the United States may apply to the Secretary for a construction subsidy to aid in construction of a new fishing vessel in accordance with this Act. No such application shall be approved by the Secretary unless he determined that (1) the plans and specifications for the fishing vessel are suitable for use in the fishery in which that vessel will operate and suitable for use by the United States for National Defense or military purposes in time of war or National emergency, (2) that the applicant possesses the ability, experience, resources, and other qualifications necessary to enable him to operate and maintain the proposed new fishing vessel, (3) will aid in the development of the United States fisheries under conditions that the Secretary considers to be in the public interest, (4) that the vessel, except under force majeure will deliver its full catch to a port of the United States, (5) that the applicant will employ on the vessel only citizens of the United States or aliens legally domiciled in the United States, (6) the vessel will be documented under the laws of the United States, and (7) such other conditions as the Secretary may consider to be in the public interest.

Sec. 3. If the Secretary, in the exercise of his discretion, determines that the granting of a subsidy applied for is reasonably calculated to carry out the purposes of this Act, he may approve such application and enter into a contract or contracts with the applicant which will provide for payment by the United States of a construction subsidy in accordance with the purposes and provisions of this Act and in accordance with any other conditions or limitations which may be prescribed by the Secretary.

Sec. 4. A construction subsidy shall be granted under this Act only to assist in the construction of a fishing vessel to be operated in (1) a fishery suffering injury from which escape clause relief has been recommended by the Tariff Commission under the Trade Agreements Assistance Act of 1959, as amended (85 Stat. 74), but where such relief has been or is hereafter denied under section 7(c) of such Act; (2) a fishery found by the Secretary to be injured by increased importation by reason of increased imports, either actual or relative, of a fish or

shellfish product, not the subject of a trade agreement tariff concession, which is like or directly competitive with the fishery's product; or (3) a fishery found by the Secretary to be injured or threatened with injury by reason of increased imports, either actual or relative, of a fish or shellfish product that is provided for in the Free List of the Tariff Act of 1930, whether or not the subject of a trade agreement tariff concession.

Sec. 5. The construction subsidy which the Secretary may pay with respect to any fishing vessel under this Act shall be an amount equal to the difference, as determined by the Maritime Administrator, between the cost of constructing such vessel in a shipyard in the United States based upon the lowest responsible domestic cost of any features incorporated in such vessel and the estimated cost, as determined by the Maritime Administrator, of constructing such vessel under similar plans and specifications in a foreign shipbuilding yard, which is determined by the Maritime Administrator to furnish a fair and representative example for the determination of the estimated total cost of constructing a vessel of the type proposed to be constructed. The amount shall be the subsidy except 35% per centum of the cost of constructing such vessel in a shipyard in the United States based upon the lowest responsible domestic bid excluding the cost of any features incorporated in the vessel for national defense uses, which shall be paid by the Department of Defense in addition to the subsidy. For the purposes of this section, the Maritime Administrator shall determine, and certify to the Secretary, the lowest responsible domestic bid.

Sec. 6. Any fishing vessel for which a construction subsidy is paid under this Act shall be constructed under the supervision of the Maritime Administrator. The Maritime Administrator shall submit the plans and specifications for the proposed vessel to the Department of Defense for examination thereof and suggestions for such changes therein as may be deemed necessary in order to expedite the construction of such vessel shall be suitable for economical and speedy conversion into a naval or military auxiliary or otherwise suitable for the use of the United States Government in time of war or national emergency. If the Secretary of Defense approves such plans and specifications as submitted, or as modified, in accordance with the provisions of this subsection, he shall certify such approval to the Secretary, and the construction subsidy shall be paid by the Secretary under this Act unless all contracts between the applicant for such subsidy and the shipbuilder who is to construct such vessel contain the provisions with respect to the construction of the vessel as the Maritime Administrator determines necessary to protect the interests of the United States.

Sec. 7. All construction with respect to which a construction subsidy is granted under this Act shall be performed in a shipyard in the United States as a result of competitive bidding, after due advertising, with the rights reserved in the applicant, and in the Maritime Administrator, to disapprove any or all bids. In all such construction the shipbuilder, subcontractor, material men, and suppliers shall use, so far as practicable, only articles, materials, and supplies of domestic growth, production, and manufacture of the United States as defined in paragraph K of section 401 of the Tariff Act of 1930. No shipbuilder shall be deemed a responsible bidder unless he possesses the experience, ability, financial resources, equipment, and other qualifications necessary properly to perform the proposed contract. The submitted bid shall be accompanied by all documents and information on which, based, and the Maritime Administrator may require that the builder or any subcontractor submit any other pertinent data relating to such bids.

Sec. 8. (a) Every contract executed by the Secretary pursuant to section 3 of this Act shall provide that in the event the United States shall, through purchase or requisition, acquire the ownership of any fishing vessel on which a construction subsidy was paid, the owner shall be paid therefor the value thereof, but in no event shall such payment exceed the actual depreciated construction cost thereof (together with the actual depreciated cost of capital improvements hereon) less the depreciated amount of construction subsidy theretofore paid incident to the construction of such vessel, or the fair and reasonable scrap value of such vessel as determined by the Maritime Administrator, whichever is the greater. Such determination shall be final. In computing the depreciated value of such vessel, depreciation shall be computed on each vessel on the schedule accepted or adopted by the Internal Revenue Service for income tax purposes.

(b) The provisions of section 2 and subsection (a) of this section relating to the requisition or the acquisition of ownership by the United States shall run with the title of each fishing vessel and be binding on all owners thereof.

Sec. 9. If any fishing vessel is operated during its useful life, as determined by the Secretary, in any fishery other than the particular fishery for which it was designed the owner of such vessel shall repay to the Secretary, in accordance with such terms and conditions as the Secretary shall prescribe, an amount which bears the same proportion to the total construction subsidy paid under this Act with respect to such vessel as the proportion that the number of years during which such vessel was operated in the fishery for which it was designed bears to the total useful life of such vessel as determined by the Secretary for the purposes of this section. Obligations under this provision shall run with the title of such vessel.

Sec. 10. The Secretary shall make such rules and regulations as may be necessary to carry out the purposes of this Act.

(1) "Secretary" means the Secretary of the Interior.

(2) "fishing vessel" means any vessel designed to be used in catching, fish, processing, or transporting fish, loaded on the high seas, or any vessel outfitted for such activity.

(3) "citizen of the United States" includes a corporation, partnership, or association organized under the laws of the United States within the meaning of section 2 of the Shipping Act, 1916, as amended.

(4) "construction" includes designing, inspecting, outfitting, and equipping and

(5) "Maritime Administrator" means the Maritime Administrator in the Department of Commerce.

Sec. 12. There is authorized to be appropriated the sum of not more than \$2,500,000 annually to carry out the purposes of this Act.

Sec. 13. No application for a subsidy for the construction of a fish, or fishing vessel, may be accepted by the Secretary after the day which is three years after the date of enactment of this Act.

Approved June 12, 1960.

48 STAT. 590
29 USC 1654,
50 USC 1654,
51 USC 1654,
52 USC 1654,
53 USC 1654,
54 USC 1654,
55 USC 1654,
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29 USC 1401-
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34 STAT. 217,
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FISHERIES COOPERATIVE MARKETING ACT AMENDMENT: The Subcommittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries on June 7, 1960, considered H. R. 2777 (McCormack), a bill to amend the Fisheries Cooperative Marketing Act, introduced in the House on January 19, 1959. The bill provides that fishermen's cooperatives shall not be subject to the provisions of the Antitrust Act.

FISHERY LOAN FUND MORTGAGE FORECLOSURES: A letter from the Assistant Secretary of the Interior, transmitting a draft of proposed legislation to facilitate administration of the fishery loan fund established by section 4 of the Fish and Wildlife Act of 1956, and for other purposes (with an accompanying paper), was laid before the Senate on June 1, 1960, by the Vice President, and referred to the Senate Committee on Interstate and Foreign Commerce. Would give Secretary of the Interior authority to dispose of property acquired through foreclosure of vessel mortgages under the fishery loan fund.

S. 3631 (Magnuson), a bill to facilitate administration of the fishery loan fund established by section 4 of the Fish and Wildlife Act of 1956, and for other purposes, introduced in the Senate on June 6, 1960, and referred to the Senate Committee on Interstate and Foreign Commerce.

FISH HATCHERIES: On June 9, the Committee on Merchant Marine and Fisheries submitted Rept. No. 1784 on S. 2053, an act to provide for the acceptance by the United States of a fish hatchery in the State of South Carolina; without amendment; referred to the Committee of the Whole House on the State of the Union.

H. Rept. No. 1784, Orangeburg County, S. C., Fish Hatchery (June 9, 1960, 86th Congress, Second Session, Report from the Committee on Merchant Marine and Fisheries to accompany S. 2053), 4 pp., printed. The purpose of the bill is to provide for a needed increase in facilities for the production of warm water fish in South Carolina. This would be accomplished by accepting title by the Secretary of the Interior to an existing hatchery facility owned by Orangeburg County, S. C., and its development by the Fish and Wildlife Service. Report discusses purpose, background, cost, and need for legislation; presents the Interior Department report on the bill. Committee reported favorably on the bill without amendment.

FISHING VESSEL MORTGAGE INSURANCE FUND: On June 9, 1960, the House Committee on Merchant Marine and Fisheries submitted Rept. No. 1785 on S. 2481, an act to continue the application of the Merchant Marine Act of 1936, as amended, to certain functions relating to fishing vessels transferred to the Secretary of the Interior, and for other purposes, without amendment; referred to the Committee of the Whole House on the State of the Union.

FOREIGN TRADE STUDY COMMISSION: S. J. Res. 208 (Dirksen), joint resolution introduced in Senate on June 13, 1960, to provide for a commission to study and report on the influence of foreign trade upon business and industrial expansion in the United States; to the Committee on Interstate and

Foreign Commerce. Resolution provides that commission shall file a final report not later than July 31, 1961.

HAWAII OMNIBUS ACT: Hawaii Omnibus Bill (Hearings before the Committee on Interior and Insular Affairs, United States Senate, 86th Congress, Second Session on S. 3054, April 29, 1960), 86 pp., printed. The purpose of the legislation is to "gather up the loose ends" in Federal legislation involved in the transition of Hawaii from a territory to a State of the United States; will make technical changes in our national laws to make Hawaii a full and equal partner with the other 49 states. Section 13 contains perfecting amendments to the statute, which authorizes the Secretary of the Interior to undertake exploration, investigation, development, and maintenance projects for fishery resources in the Pacific. Inappropriate references to the "Territory" of Hawaii and to the "Hawaiian Islands" would be deleted or modified by the amendments. Report contains statements and communications from Federal officials, Congressmen, and officials of business firms; the text of the bill; the report of the Bureau of the Budget; and a section by section analysis.

IMPORTS IMPACT ON SMALL BUSINESS: The Subcommittee on Relations of Business with Government of the Senate Select Committee on Small Business held hearings on June 16, on the subject of the impact of imports on American small business. Government witnesses were heard, as well as numerous public witnesses representing various segments of industry and several organizations. Hearings were adjourned subject to call.

INTERIOR DEPARTMENT APPROPRIATIONS: On May 5, 1960, the House adopted by a voice vote the conference report on H. R. 10401, a bill making appropriations for the Department of the Interior and related agencies for fiscal year 1961, and sent the legislation to the Senate. Two Senate amendments were reported in disagreement on which the House voted to recede and concur therein.

The President signed H. R. 10401 on May 13, 1960 (P. L. 86-455).

H. Rept. No. 1571, Department of the Interior and Related Agencies Appropriation Bill, 1961 (May 3, 1960, 86th Congress, Second Session, Report of the Committee on Conference, to accompany H. R. 10401), 8 pp., printed. The two Houses disagreed on the amendments of the Senate to H. R. 10401, appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1961, and for other purposes. The Committee on Conference agreed to recommend to their respective Houses various amendments, among which Amendment No. 24 pertains to the Bureau of Commercial Fisheries: Appropriates \$6,591,000 for management and investigations of resources instead of \$7,051,000 as proposed by the Senate and \$6,249,000 as proposed by the House. The increase provided over the House bill is for the following: pesticides research, \$67,000; industrial fisheries research (menhaden, sardines, and herring), \$175,000; South Atlantic exploratory fishing gear and development program, \$100,000. In addition, the conferees direct that \$60,000 be made available for this latter program from Saltonstall-Kennedy funds to make a total of \$160,000 available

during fiscal year 1961. For the Bureau of Sport Fisheries and Wildlife Amendment 22 appropriates \$18,645,000 for management and investigations of resources instead of \$18,770,000 as proposed by the Senate and \$18,220,000 as proposed by the House. The increase provided over the House bill is as follows: Assistance to Navajo, Hopi, Fort Apache, and Zuni Indian Reservations in fishery management, \$25,000; research on effects of pesticides on fish and wildlife, \$250,000; and marine sport fisheries research, \$150,000. Amendment No. 23 appropriated \$4,535,000 for construction instead of \$4,841,000 as proposed by the Senate and \$3,485,000 as proposed by the House. The increase provided over the House bill is for the following hatcheries: Alchey Springs, Ariz., \$260,000; Garrison Dam, N. Dak., \$200,000; Corning, Ark., \$100,000; Erwin, Tenn., \$100,000; Creston, Mont., \$130,000; Gavins Point Dam, S. Dak., \$150,000; Hot Springs, N. Mex., \$100,000; and for a survey, Walker Lake area, Nevada, \$10,000.

LAW OF THE SEA CONVENTIONS: By a record vote the Senate on May 26, 1960, ratified en bloc five treaties, all from 86th Congress, 1st Session: Convention on the Territorial Sea and the Contiguous Zone (Ex. J); Convention on the High Seas (Ex. K); Convention on Fishing and Conservation of the Living Resources of the High Seas (Ex. L); Convention on the Continental Shelf (Ex. M); and Optional Protocol of Signature Concerning Compulsory Settlement of Disputes on Law of the Sea (Ex. N). Following objections of several Senators to the voting en bloc of these treaties, another vote was taken on Optional Protocol of Signature Concerning Compulsory Settlement of Disputes on Law of the Sea (Ex. N), the Senate failed to agree to resolution of ratification of that treaty. An affirmative two-thirds vote is necessary for ratification. So the Senate, in essence, rejected the Optional Protocol which would give the World Court jurisdiction over all disputes arising under the Law of the Sea Convention signed at Geneva.

The four conventions that were ratified codify existing international law and establish some new international law with respect to activities on the seas.

On May 27, 1960, a motion was made by Senator Mansfield to reconsider the vote by which the resolution approving ratification of Ex. N., 86th Congress, 1st Session, was disagreed to. The motion to reconsider permits debate and full explanation and clarification of Ex. N.

NATIONAL AQUARIUM IN DISTRICT OF COLUMBIA: H. R. 12634 (Kirwin), introduced in the House on June 14, 1960, a bill to authorize the Secretary of the Interior to construct a national aquarium in the District of Columbia; referred to the Committee on the District of Columbia.

NATIONAL FISHERIES CENTER: H. R. 9979 (Foley), a bill to create a Federal planning commission to conduct a study of the possible establishment of a national fisheries center in the District of Columbia; to the Committee on the District of Columbia; introduced in House January 27, 1960. Identical to other bills previously introduced.

OCEANOGRAPHIC NATIONAL DATA CENTER: H. R. 12018 (George P. Miller) on May 2, 1960, in-

troduced in the House a bill to establish within the U. S. Coast and Geodetic Survey a National Oceanographic Data Center and a National Instrumentation Test and Calibration Center; to the Committee on Merchant Marine and Fisheries.

OCEANOGRAPHY (Hearing before the Special Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, 86th Congress, 2nd Session, on S. 2482, to remove geographical limitations on activities of the Coast and Geodetic Survey, and for other purposes; and S. 2483, to provide flexibility in the performance of certain functions of the Coast and Geodetic Survey, and of the Weather Bureau, January 22, 1960), 35 pp., printed. Contains statements of government officials; letters and resolutions of various organizations. This legislation would advance the marine sciences and enlarge the abilities of the Coast and Geodetic Survey to enable it to conduct surveys in waters which extend beyond the immediate territories of the United States set forth in existing Coast and Geodetic Survey authority; and would simplify the administrative action of the Coast and Geodetic Survey and Weather Bureau, authorizing the Secretary of Commerce to fix certain rates of pay for extra compensation for members of crews of vessels when assigned to certain duties and to employees of other agencies when performing certain duties for the Coast and Geodetic Survey.

OCEANOGRAPHIC RESEARCH PROGRAM: On May 18, 1960, the Senate Committee on Interstate and Foreign Commerce in executive session, ordered favorably reported without amendment S. 2692 (Magnuson & 10 other Senators), a bill introduced in the Senate on September 11, 1959. The purpose of the bill is to advance the marine sciences, to establish a comprehensive 10-year program of oceanographic research and surveys; to promote commerce and navigation, to secure the national defense; to expand ocean resources; to authorize the construction of research and survey ships and facilities; to assure systematic studies of the effects of radioactive materials in marine environments; to enhance the general welfare, and for other purposes. Titled "The Marine Sciences and Research Act of 1959" the bill provides for a 10-year program relating to Oceanographic Research and objectives expressed in Senate Resolution 136, previously introduced and adopted by Senate. Report No. 1525 was reported by the Committee on Interstate and Foreign Commerce, with amendments on June 7, 1960.

Marine Science (Hearings before the Committee on Interstate and Foreign Commerce United States Senate, 86th Congress, Second Session, on S. 2692, April 20, 21, and 22, 1960), 165 pp., printed. Contains statements, letters, communications, reports, resolutions, and tables from various government and state agencies, commissions, universities, laboratories, etc. The Bureau of Commercial Fisheries, Fish and Wildlife Service, submitted 3 tables: Table 1 - research contracts either negotiated or in effect in fiscal year 1960; Table 9 - contracts negotiated with Saltonstall-Kennedy Act funds, fiscal years 1955-60; Table 12 - contracts utilizing Saltonstall-Kennedy Act funds (analysis by contracting organization and location).

OCEANOGRAPHY EDUCATIONAL ASSISTANCE:

Frontiers in Oceanic Research (Hearings before the Committee on Science and Astronautics, U. S. House of Representatives, 86th Congress, Second Session, April 28 and 29, 1960, on H. R. 6298), 76 pp., printed. This legislation provides financial assistance to educational institutions for the development of teaching facilities, provides fellowships in the field of oceanography, and provides fellowships for graduate study in such fields. Contains statements of a geochemistry professor, California Institute of Technology, and Chairman, Committee on Oceanography, National Academy of Sciences; Director of Development Planning, Lockheed Aircraft Corporation, Burbank, California; the scientist in charge of the Navy's bathyscope program; and the Assistant Secretary of the Navy for Research and Development.

POLLUTION OF THE SEA BY OIL: Executive C, 86th Congress, Second Session, was reported from the Committee on Foreign Relations on June 2, 1960. The International Convention for the Prevention of Pollution of the Sea by Oil, 1954, was signed at London, on May 12, 1954, in behalf of certain states, but not the United States (Ex. Rept. No. 5). This Convention would help clean up the ocean oil pollution which annually kills thousands of water birds, fish, shellfish, and other wildlife.

PUBLIC WORKS APPROPRIATION BILL, 1961: The Committee on Appropriations held an additional hearing on H. R. 12326 (Cannon), a bill introduced in the House on May 20, 1960, fiscal 1961 appropriations for public works. This legislation includes funds for the Fish and Wildlife Service for studies on effect of certain public works construction on fish and wildlife; Lower Columbia River fish sanctuary program; and also, the Committee requested that consideration be given to transferring the Columbia Fisheries Program under Public Works Appropriations to the budget for the Fish and Wildlife Service.

Public Works Appropriation Bill, 1961 (Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, 86th Congress, Second Session, Part 2), 98 pp., printed. Contains statements of public officials; project data sheets; tables; and details of projects. Nearly each project lists funds for studies of effect of project upon fish and wildlife. Includes funds (\$750,000) to permit detailed studies by the Fish and Wildlife Service of 191 Corps of Engineers and the Bureau of Reclamation projects in the United States, exclusive of the Missouri River Basin. These studies are provided for in the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U. S. C. 661 et seq.) which require that the Fish and Wildlife Service determine the probable effects on fish and wildlife resources of water control projects proposed under the jurisdiction or control of the Federal Government and to insure that wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs. Measures are recommended to protect and, where possible, to develop and improve fish and wildlife. The act authorizes transfer of funds for these studies to the Fish and Wildlife Service from moneys appropriated to the Federal construction agencies for Investigations, engineering, or construction. Each project and its cost for fish and wildlife study is listed.

H. R. 12326 (Cannon), introduced in the House on May 20, 1960, a bill making appropriations for civil functions administered by the Department of the Army, certain agencies of the Department of the Interior, the Atomic Energy Commission, the Tennessee Valley Authority and certain study commissions, for the fiscal year ending June 30, 1961, and for other purposes. This bill was reported without amendment on May 20, 1960 (H. Rept. No. 1634).

H. Rept. No. 1634, Public Works Appropriation Bill, 1961 (May 20, 1960, 86th Congress Second Session, Report from the Committee on Appropriations to accompany H. R. 12326), 45 pp., printed. This legislation includes funds for the Fish and Wildlife Service for studies on effect of certain public works construction on fish and wildlife, \$500,000; Lower Columbia River fish sanctuary program, \$1,400,000. Also, the Committee requested that consideration be given to transferring the Columbia Fisheries Program under Public Works Appropriations to the budget for the Fish and Wildlife Service.

The Committee of the Whole House on the State of the Union concluded consideration of H. R. 12326 on May 24, 1960, but deferred final action on the bill until May 25, 1960, upon development of a record vote on a motion to recommit the bill. The recommittal motion was designed to prevent use of any funds for construction of the Allegheny River Reservoir in Pennsylvania and New York. No amendments were adopted. On May 25, 1960, the bill passed the House with Allegheny River Reservoir included and was sent to the Senate. Was referred to Senate Committee on Appropriations.

SALMON IMPORT RESTRICTIONS: Hearings by the Subcommittee on Merchant Marine and Fisheries of the Senate Committee on Interstate and Foreign Commerce continued hearings on May 18, 1960, on S. 502, a bill introduced in Senate January 20, 1959, to facilitate the application and operation of the Fish and Wildlife Act of 1956, and for other purposes.

SALTONSTALL-KENNEDY ACT FUNDS RE-APPORTIONMENT: H. R. 12141 (Coffin), introduced in House on May 10, 1960, a bill to amend the Act of August 11, 1939, with respect to the allocation of funds available under that Act, and for other purposes. The Act entitled "An Act to authorize the Federal Surplus Commodities Corporation to purchase and distribute surplus products of the fishing industry," as amended, is further amended. It would allow the Secretary of the Interior, after deducting 8 percentum for his expenses in the conduct of necessary investigations, administration, and execution of this Act, to allocate funds for the purposes mentioned in this section to the agencies, organizations, and individuals mentioned in this section as follows: (1) one-third in the form of grants; (2) one-third in the form of contracts; and (3) one-third for apportionment on an equitable basis, as the Secretary of the Interior may determine, among the several states. In making such apportionments the Secretary of the Interior shall take into account the extent of the fishing industry within each state as compared with the total fishing industry of the United States and such other factors as may be relevant in view of the purposes of this section.

Any state desiring to avail itself of the benefits of this section shall, through its state fisheries department, submit to the Secretary of the Interior full and detailed statements of any project proposed for that state. If the Secretary of the Interior finds that such project is consistent with the purposes of this section, and meets with standards to be established by him and otherwise approves such project, the state fisheries department shall furnish him such detailed surveys, plans, specifications, and estimates with respect to such project as he may request. If the Secretary of the Interior approves such detailed surveys, plans, specifications, and estimates, he shall so notify the state fisheries department. No part of any moneys apportioned under this subsection shall be paid with respect to any project until the detailed surveys, plans, specifications, and estimates have been approved by the Secretary of the Interior, and not more than 50 percent of the total estimated cost of the approved project shall be paid from funds made available under this section. If any funds made available for an approved project under this section are not used by the state for that project, that state shall not receive any further funds under this section until it shall have replaced the misapplied funds. Allocation to the states would be based on a formula involving the volume and value of their fisheries and the number of fishermen engaged in the fishing industry. Also, each state would be required to match the funds approved for use of that state. The amendment would take effect July 1, 1961.

This bill is identical to H. R. 12142 (Antuso), H. R. 12143 (Lennon), H. R. 12144 (Geo. P. Miller), H. R. 12145 (Oliver), H. R. 12146 (Pelly), and H. R. 12147 (Thompson of Louisiana)—all introduced in the House on May 10, 1960; similar but not identical to H. R. 10939 (Rivers of Alaska), introduced in House on March 7, 1960. H. R. 12215 (McIntire), introduced in the House on May 12, 1960, identical to seven bills introduced in House on May 11, 1960, and similar to one on March 7, 1960.

S. 3658 (Gruening, for himself and Magnuson, Jackson, Morse, Lusk, and Engle), introduced in the Senate on June 10, 1960, a bill to amend the act authorizing the use for fishery research and other purposes of 30 percent of amounts collected as custom duties on fishery products in order to increase such percentage to 60; to the Committee on Interstate and Foreign Commerce.

While the bill contains no stipulation on how additional funds available under the expanded program would be spent, Senator Gruening states in a speech in the Senate that the purpose of the bill is to provide additional funds "for the rehabilitation of the salmon fishing resources of the Pacific Northwest, particularly those in Alaska."

SHRIMP CONSERVATION CONVENTION WITH CUBA: S. 2867 (Magnuson), introduced in the Senate January 20, 1960, a bill to give effect to the Convention between the United States and Cuba for the conservation of shrimp, signed at Havana, August 15, 1958; was reported to the Senate by the Committee on Interstate and Foreign Commerce on May 12, 1960 (S. Rept. No. 1346).

S. Rept. No. 1346, **Shrimp Conservation Act** (May 12, 1960, 86th Congress, Second Session, Report from the Committee on Interstate and For-

eign Commerce, to accompany S. 2867), 7 pp., printed. The bill, which was introduced at the request of the Department of State, would implement a convention for the conservation of shrimp between the United States and Cuba, signed at Havana, August 15, 1958. The Senate gave its advice and consent to the ratification of the convention, June 4, 1959.

The Commission for the Conservation of Shrimp, to be established by the convention, will have two national sections, each composed of three members appointed by the respective Governments. Each section will have one vote, and both must approve any decisions of the Commission. Each Government may establish an advisory committee for its national section. The Commission will have two principal duties: First it will obtain and disseminate scientific information regarding stocks of shrimp of common concern in the convention area. Secondly, on the basis of its findings, it will adopt appropriate regulations which will enter into force 50 days after notification to the parties, in the absence of objection by either party.

Share of the joint expenses of the Commission will be determined by the proportion of the total shrimp catch from the convention area by vessels belonging to the respective countries. Initially the United States would have the largest share of the expense, but Cuba's share will be expected to increase.

Enforcement of the legislation would be by the Coast Guard, Department of the Interior, Bureau of Customs, or Federal officers and employees designated so to act by the Secretary of the Interior. Judges of the U. S. District Courts and the U. S. Commissioners, within their jurisdiction, would be authorized to issue warrants or other process necessary to enforce the legislation. Shrimp and gear used to take same in violation of this proposed act, could be seized, and persons in violation could be fined up to \$5,000 for the first offense and up to \$10,000, and catch and gear ordered forfeited. Committee amendment changes the "Shrimp Conservation Act of 1959," to "Shrimp Conservation Act of 1960." Despite recent occurrences in Cuba, the Department of State still favors the enactment of this legislation. The committee points out that this is a matter of an economic nature between the two countries, and should not be evaluated on any other basis. Report contains letters from various agencies stating their approval of the enactment of this legislation.

On May 26, 1960, the Senate considered S. 2867, a bill which had been reported out by the Committee on Interstate and Foreign Commerce with amendment. The amendment was agreed to, the bill was read for the third time, and passed.

SHRIMP IMPORT DUTIES: The Commissioners Court of Brazoria County, Tex., on April 11, 1960, and the Propeller Club of the United States, Port of Brownsville and Port Isabel, Tex., on February 18, 1960, sent resolutions to the Senate urging congressional passage of pending bills establishing country-by-country quotas on shrimp imports (S. 3204 and H. R. 8769).

S. 3639 (Long, and others), a bill for the relief of the domestic shrimp industry, introduced in the

Senate on June 7, 1960, and referred to the Committee on Finance. The purpose of this legislation is to grant temporary quotas to meet distressed conditions in the domestic shrimp industry.

SMALL BUSINESS ACT AMENDMENTS: S. 3698 (Proxmire, for himself, Sparkman, Hart, Fulbright and Capehart), by unanimous consent, on June 16, 1960, introduced bill to amend the Small Business Act, and for other purposes; referred to the Committee on Banking and Currency. This legislation would increase by \$75 million the authorization for the revolving fund for the Small Business Administration's regular business loan program.

SMALL BUSINESS INVESTMENT ACT OF 1958 AMENDMENTS: On May 14, 1960, S. 2611, a bill which was introduced in the Senate on August 27, 1959, to amend the Small Business Investment Act of 1958, and for other purposes, was reported with amendments by the Committee on Banking and Currency and committed to the Committee of the Whole House on the State of the Union (H. Rept. 1608). The legislation provides for amendments to the Small Business Act of 1958 (P. L. 85-833), for the purpose of removing certain legal impediments to the formation and successful operation of small business investment companies. Passed House amended June 6, 1960. After concurring to House amendments, the Senate cleared for President S. 2611 (Proxmire). Approved and signed by the President on June 11, 1960 (P. L. 86-502).

H. Rept. No. 1608, Small Business Investment Act Amendments of 1960 (May 14, 1960, 86th Congress, Second Session, Report of the Committee on Banking and Currency to accompany S. 2611), 12 pp., printed. Contains purpose and provisions of the bill; committee recommendations; names, locations, and capital structure of licensed Small Business Investment Companies; section by section summary of the bill and amendments. The purpose of this legislation is to remove certain legal impediments to the formation and successful operation of small business investment companies.

SPORT FISHING ORGANIZATIONS MAIL RATE EXTENSION: H. R. 12333 (Johnson of Maryland), introduced in the House on May 23, 1960, a bill to extend to nonprofit sport fishing or fishing fair or contest organizations and associations the third-class mail rates applicable to certain categories of nonprofit organizations or associations; to the Committee on Post Office and Civil Service.

TARIFF NEGOTIATIONS: H. Con. Res. 697 (Hiestand), introduced on June 1, a concurrent resolution expressing the sense of Congress that the United States should not grant further tariff reductions in the forthcoming tariff negotiations under the provisions of the Trade Agreements Extension Act of 1958, and for other purposes; to the Committee on Ways and Means. H. Con. Res. 699, introduced in the House on June 13, is similar to H. Con. Res. 697.

TARIFF REDUCTIONS AND WAGE DIFFERENTIALS: S. Con. Res. 110 (Bush), introduced in Senate on June 14, 1960, a concurrent resolution relative to consideration of certain tariff reductions and wage differentials at the coming GATT Conference; referred to the Committee on Finance.

UNEMPLOYMENT RELIEF IN DEPRESSED AREAS: On May 6, 1960, the Senate adopted a motion by Johnson (Texas), to agree to the House amendment to S. 722, a bill to establish an effective program to alleviate conditions of unemployment and underemployment in certain economically depressed areas. This action cleared the bill for the President.

On May 9, 1960, the Secretary of the Senate presented to the President of the United States for signature S. 722. The President vetoed S. 722 on May 13, 1960. On May 24, 1960, the Senate debated and voted to override the Presidential veto. This attempt was defeated because a two-thirds affirmative vote, which is necessary to override a Presidential veto, was not polled.

WAGES--MINIMUM HOURLY RATE INCREASE: The Subcommittee on Labor Standards of the House Committee on Education and Labor met in Executive session on May 31, 1960, to mark-up H. R. 4488 (Roosevelt), introduced on February 16, 1959, a bill to amend the Fair Labor Standards Act of 1938 to establish a \$1.25 minimum hourly wage, and for other purposes.

Minimum Wage-Hour Legislation (Hearings before the Subcommittee on Labor Standards of the Committee on Education and Labor, House of Representatives, 86th Congress, Second Session, on various bills regarding minimum wage legislation, March 16, 17, 23, 24, 29, 30, 31, and April 7, 11, and 13, 1960 - Part I), 490 pp., printed. Contains statements and letters of union leaders; industry officials; employers and employees in various industries; government officials; and various exhibits, charts, and tables. Sixty-seven bills have been introduced in Congress, all dealing with the same subject matter, and generally to the same extent. This legislation is designed to substantially increase the Federal minimum wage and extend the coverage of the Fair Labor Standards Act of 1938 to include some 20 million workers who are not now covered. One of the bills, H. R. 4488, would eliminate minimum wage and overtime exemptions for employees "in packing, canning, or other processing of fish or seafood products (but fishing and other occupations which precede processing of such products continue to be exempt)."

Minimum Wage-Hour Legislation (Hearings before the Subcommittee on Labor Standards of the Committee on Education and Labor, U. S. House of Representatives, 86th Congress, Second Session, on various bills regarding minimum wage legislation, April 19, 20, 21, 26, 27, and May 3 and 5, 1960 - Part II), 948 pp., printed. Contains letters, prepared statements and supplemental material of labor officials; industry officials; government and state officials; and various charts, exhibits, and tables.

WAGES--MINIMUM HOURLY RATE INCREASE: H. R. 12677 (Roosevelt), introduced on June 15, 1960, a bill to amend the Fair Labor Standards Act of 1938, as amended, to provide coverage for employees of large enterprises engaged in retail trade or service and of other employers engaged in activities affecting commerce, to increase the minimum wage under the Act of \$1.25 an hour, and for other purposes; to the Committee on Education and Labor.

The Senate Committee on Labor and Public Welfare continued its executive consideration of S. 1046 (Kennedy and others), introduced in the Senate February 16, 1959, a bill proposing amendments to the Fair Labor Standards Act, but did not conclude action, and on June 15 recessed subject to call. Committee has removed the fishery exemption from the bill, except that seafood processing and canning have retained the overtime exemption.

The House Committee on Education and Labor continued on June 15 in executive session consideration of H. R. 4488 (Roosevelt), introduced in the House on February 16, 1959, a bill to amend the Fair Labor Standards Act of 1938 in regard to increasing the Federal minimum wage to \$1.25 an hour.

On June 16, 1960, the House Committee on Education and Labor met in executive session and ordered favorably reported to the House H. R. 12677. The bill retains existing year-round exemption from overtime for fish cannery and increases statutory minimum wage to \$1.15 an hour on November 1 this year, to \$1.20 an hour on November 1, 1961, and to \$1.25 an hour on November 1, 1962; also would continue wage order program for employees in Puerto Rico, the Virgin Islands, and American Samoa, and would provide for increases in their wages reflecting the same percentage as the annual increases on the mainland. The general fishery exemption in the bill is the same as in present law except for a few words. The bill provides that "any employee employed in or necessary to the conduct of the catching, taking, harvesting, cultivating, 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 including employment in or necessary to the conduct of the loading, unloading, or packing of such products for shipment or in propagating, processing (other than canning), marketing, freezing, curing, storing, or distributing the live products or byproducts thereof; . . ." is exempt

from Sections 6 and 7 of the Act. In addition, the bill also provides that "any employee employed in the canning of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life; or any byproduct thereof; . . ." is exempt from Section 7 of the Act.

WATER CONSERVATION ACT OF 1959: Policy and Procedure for the Development of Water Resources (Hearing before the Committee on Public Works, House of Representatives, 86th Congress, Second Session on H. R. 8, April 27, 1960), Part 2, 315 pp., printed. The bill H. R. 8, introduced in the House on January 7, 1959, would promote and establish policy and procedure for the development of water resources of lakes, rivers, and streams. The report on the hearing contains statements of members of Congress, various public officials, and public utility officials. Among other things, this legislation provides that the development of water resources by the United States shall be based upon adequate and reliable data and shall be so planned and prosecuted on a comprehensive multiple-purpose basis to achieve maximum sustained usefulness of resources for all beneficial purposes; to protect and promote commerce among the several states, and the general welfare, security, and defense of the United States.

WILDLIFE, FISH, AND GAME CONSERVATION: A Special Subcommittee hearing was held on May 19, on H. R. 2565, a bill which was introduced in the House on March 23, 1960, to promote effectual planning, development, maintenance, and coordination of wildlife, fish, and game conservation and rehabilitation in military reservations.

On May 27, 1960, the Senate Committee on Interior and Insular Affairs submitted Report No. 1492 on H. R. 2565.

H. R. 2565, was passed over by the Senate, by the request of New York State authorities, on June 2, 1960.



Editorial Assistant--Ruth V. Keefe

Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, and Vera Eggleston

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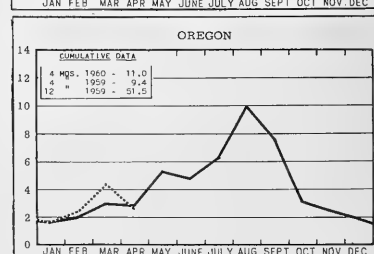
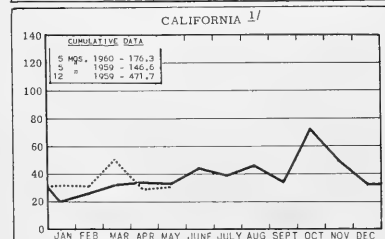
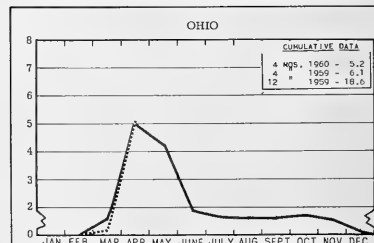
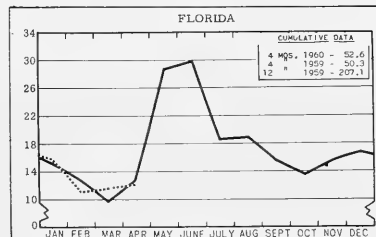
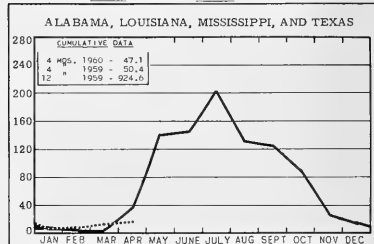
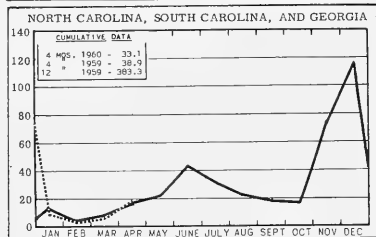
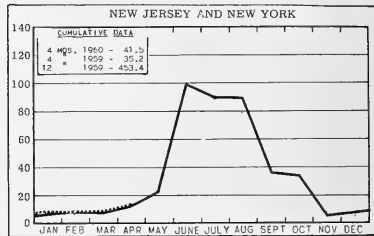
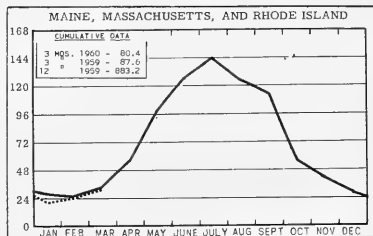
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FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES

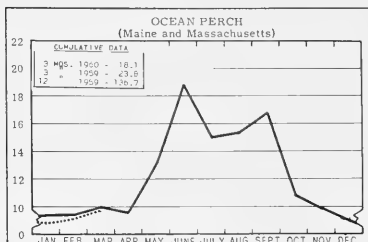
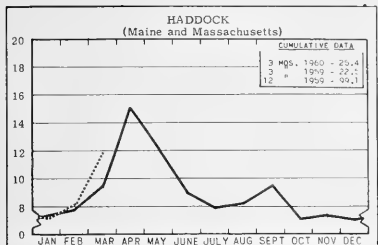
In Millions of Pounds



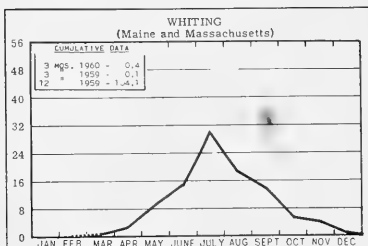
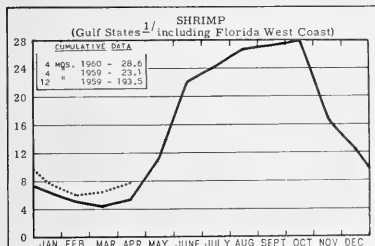
^{1/} ONLY PARTIAL—INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

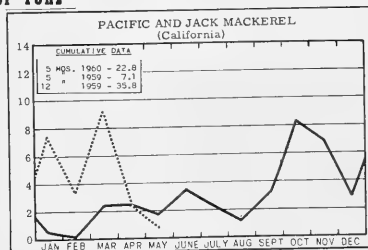
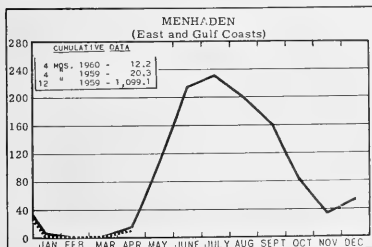


In Millions of Pounds



^{1/2}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

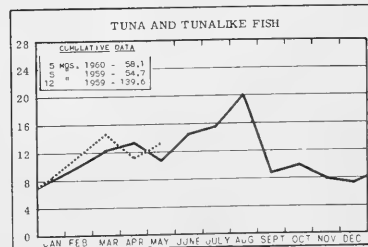
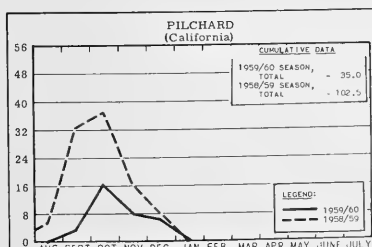
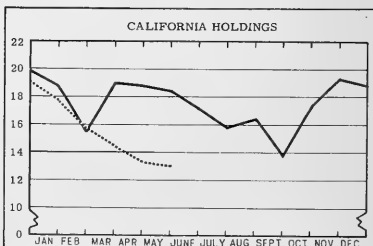
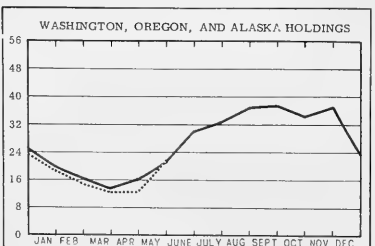
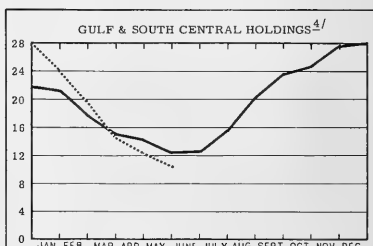
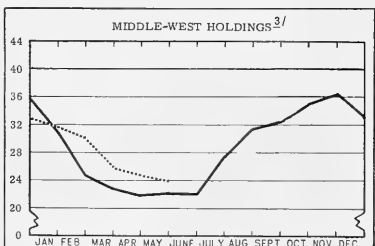
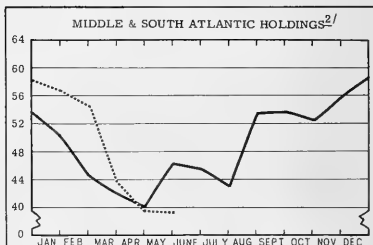
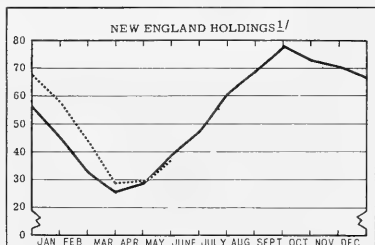
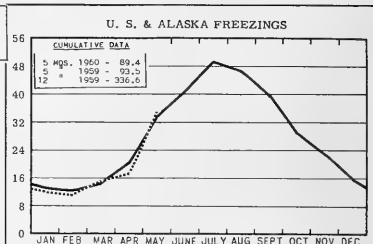
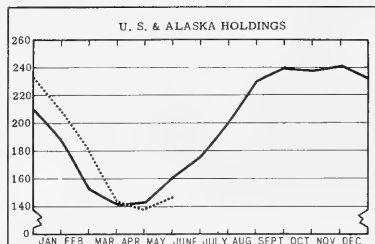


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

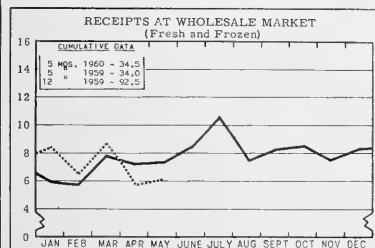
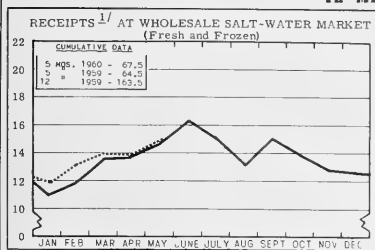
In Millions of Pounds



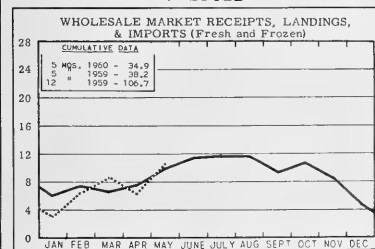
* Excludes salted, cured, and smoked products.

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

In Millions of Pounds



SEATTLE



LEGEND:
 1960
 - - - - - 1959
 - - - - - 1958

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

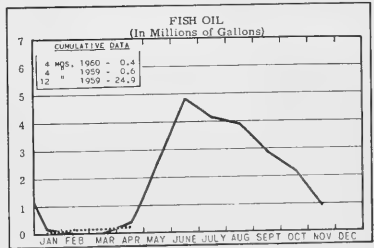
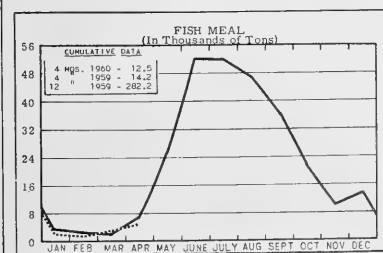
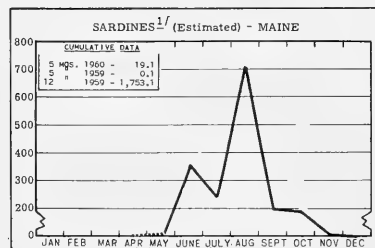
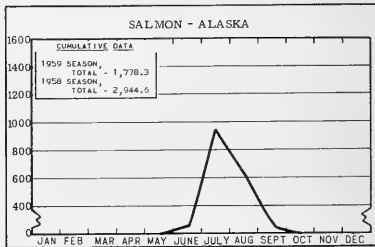
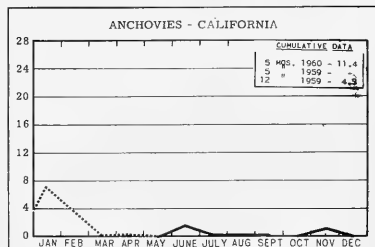
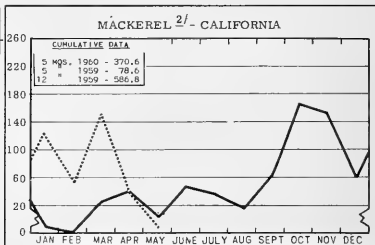
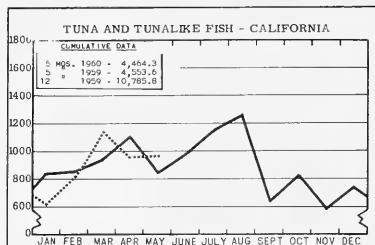


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	1/4 drawn	3 1/2 oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# 1/2 tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	1/2-lb.	8 oz.

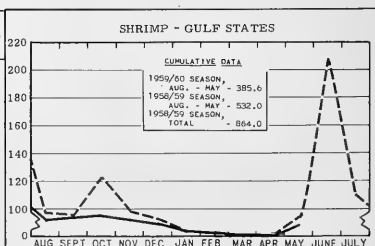
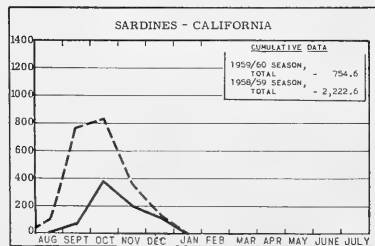
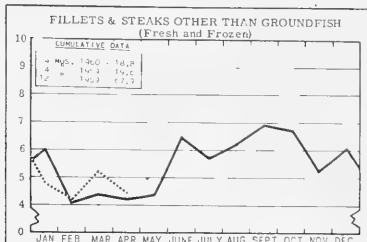
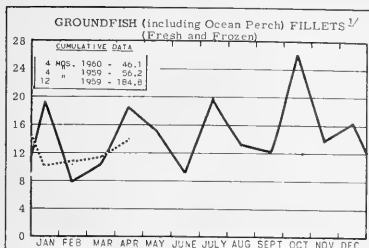
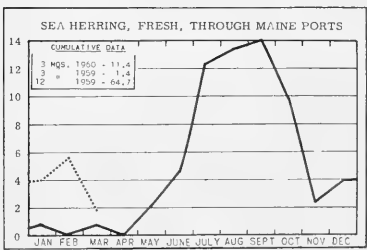
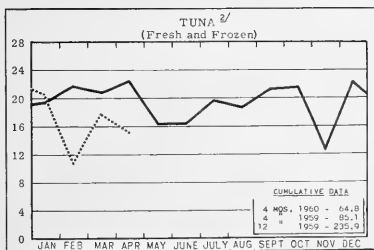
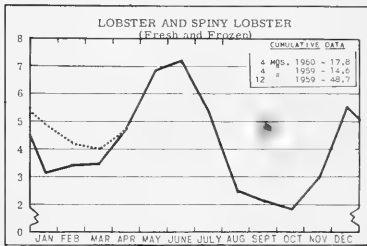
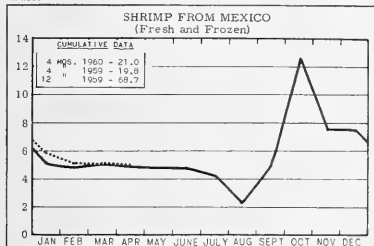


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

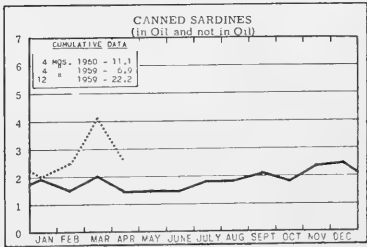
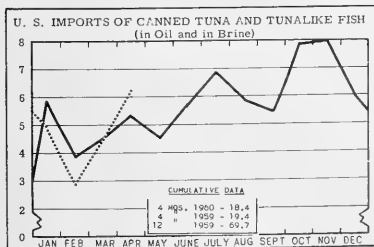
In Millions of Pounds



^{1/}SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1960.



^{2/} EXCLUDES LOINS AND DISCS.





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.
 SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 SSR. - FISHERY - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
|----------|---|
| CFS-2246 | - Massachusetts Landings, 1959 Annual Summary, 16 pp. |
| CFS-2250 | - Florida Landings, 1959 Annual Summary, 10 pp. |
| CFS-2256 | - Maine Landings, 1959 Annual Summary, 11 pp. |
| CFS-2268 | - Frozen Fish Report, March 1960, 8 pp. |
| CFS-2289 | - Alabama Landings, 1959 Annual Summary, 3 pp. |
| CFS-2292 | - New York Landings, February 1960, 4 pp. |
| CFS-2294 | - Texas Landings, February 1960, 3 pp. |
| CFS-2295 | - Louisiana Landings, November 1959, 2 pp. |
| CFS-2296 | - Louisiana Landings, December 1959, 2 pp. |
| CFS-2297 | - Virginia Landings, March 1960, 3 pp. |
| CFS-2298 | - Maryland Landings, March 1960, 3 pp. |
| CFS-2300 | - Massachusetts Landings, January 1960, 4 pp. |
| CFS-2302 | - Louisiana Landings, January 1960, 2 pp. |
| CFS-2307 | - Georgia Landings, March 1960, 2 pp. |
| CFS-2311 | - Florida Landings, March 1960, 6 pp. |
| CFS-2313 | - New York Landings, March 1960, 4 pp. |
| FL-393 | - Fisheries of the United States, 1959 (A Preliminary Review), by E. A. Power, 52 pp., illus., revised April 1960. A preliminary review of commercial fishery activities in 1959, well illustrated with graphs and charts. In addition to data on production, consumption, prices, manufactured fishery products, value of industry and capital investments, and supplies of certain fishery products, this leaflet contains information on fishery imports and exports, and world fisheries. |

Wholesale Dealers in Fishery Products, 1959 (Revised):

- SL-7 - New Jersey, 1959.
 SL-13 - North Carolina, 1959.
 SL-14 - South Carolina, 1959.
 SL-15 - Georgia, 1959.
 SL-17 - Alabama (Coastal Area), 1959.

- SL-18 - Mississippi (Coastal Area), 1959.
 SL-26 - Illinois (Great Lakes Area), 1959.
 SL-27 - Indiana (Great Lakes Area), 1959.

Firms Canning, 1959 (Revised):

- SL-102 - Maine Sardines (Including Sea Herring).
 SL-102A - Pacific Sardines.
 SL-104 - Mackerel.
 SL-111 - Clam Products.
 SL-116 - Food for Animals, From Marine-Animal Products.

Firms Manufacturing, 1959 (Revised):

- SL-154 - Seaweed Products.
 SL-160 - Menhaden Products.

- SSR-Fish. No. 292 - North Pacific and Bering Sea Oceanography, 1957, by Felix Favorite and Glenn M. Pedersen, 110 pp., illus., May 1959.

- SSR-Fish. No. 312 - North Pacific and Bering Sea Oceanography, 1958, by Felix Favorite and Glenn Pedersen, 333 pp., illus., November 1959.

- SSR-Fish. No. 327 - Herring of the North European Basin and Adjacent Seas (Translations from Russian), edited by Leslie W. Scattergood, 286 pp., illus., November 1959. Includes articles on "The Fundamental Stage of the Life-Cycle of Atlantic-Scandinavian Herring," by Y. Y. Marti; "Chart of Consonant Currents in the Norwegian and Greenland Seas," by A. P. Alekseev and B. V. Istoshin; "Plankton as an Indicator of Waters of Different Origins," by V. D. Abramova; "Seasonal Changes in Plankton and Feeding Migrations of Herring," by E. A. Pavshitski; "Data on the Food of the Atlantic Herring," by V. A. Rudokova; "Investigation into the Life-Cycle of Summer-Spawning Herring of Iceland," by K. A. Liamin; "The Oogenesis and Ecology of the Sexual Cycle of the Murmansk Herring (*Clupea harengus harengus* L.)," by V. M. Naumov; "Experimental Tagging of Herring in Kandalaksha Bay in 1953-1954," by A. P. Vilson; and "The Biological Foundation of the Fishery of the White Sea Herring," by B. M. Tambovtsev.

- SSR-Fish. No. 328 - Sardine Eggs and Larvae and Other Fish Larvae, Pacific Coast, 1957, by Elbert Ahlstrom, 104 pp., illus., December 1959.

- Annual Report of the Biological Laboratory, Woods Hole, Mass. (for the Year Ending June 30, 1959), Circular 80, 55 pp., illus., processed. This report, constituting part of the annual report of the Branch of Fishery Biology, presents a summary of research activities in the Northwest Atlantic Fishery Investigations program and a description of vessels and shore facilities.

tics. As in past years, the research program was directed primarily toward problems associated with the offshore groundfish and sea scallops upon which the New England fishing industry is mainly dependent. The major groundfish species concerned are cod, haddock, ocean perch, whiting, and the species taken by the industrial trawl fishery.

Annual Report of the Fish and Wildlife Service, Bureau of Commercial Fisheries, Bureau of Sport Fisheries and Wildlife, for the Fiscal Year 1959, 46 pp., illus., printed. (Reprinted from the Annual Report of the Secretary of the Interior, for the Fiscal Year Ended June 30, 1959.) Summarizes the various activities of the Service. Describes the activities of the Bureau of Commercial Fisheries; Industrial Research and Services; Columbia River Fisheries Program; Pribilof Islands fur-seal industry; and biological research (shellfish anadromous, inland, and marine fisheries). Bureau of Sport Fisheries and Wildlife activities discussed include Federal aid to the states for the restoration of fish and wildlife, fish hatcheries; fishery management services; and river basin studies.

National Wildlife Refuges in the Northeast (Region 5), 4 pp., illus., February 1960.

Report of the Secretary of the Interior to the President and the Congress on Fresh, Frozen, and Processed Shrimp, 112 pp., processed April 1960. A comprehensive report on the fresh, frozen, and processed shrimp industries prepared for the President and Congress in compliance with Section 9(b) of Public Law 1024, 84th Congress, the Fish and Wildlife Act of 1956 (70 Stat. 1119), enacted August 8, 1956. The investigation upon which this report is based was conducted at the request of a national shrimp organization whose members have accounted for over 70 percent of the U. S. production of shrimp. The request was prompted by a growing apprehension in the shrimp industry over its economic future. As important elements contributing to their concern, shrimp producers have cited (1) an increase in the total U. S. supply resulting mainly from high import volumes in 1958 and 1959, (2) a decrease since 1953 in the average annual catches of individual shrimp trawlers, (3) an increase in production costs during the 1950's, (4) record-high cold-storage holdings of shrimp in 1959, and (5) a sharp downturn in prices paid to shrimp fishermen during 1959. The shrimp industry is composed of many segments, such as trawler owners, fishermen, shore-plant operators, processors, shipbuilders and provisioners, importers, brokers, and distributors. Each group is affected differently by changing conditions in total supply, prices, production costs, and imports. This report is concerned principally with the factors affecting the producing segments of the domestic shrimp industry. Other factors, such as the impact of the present shrimp situation on the consumer, on U. S. trade interests, and on other matters of public interest, have not been considered.

Sep. No. 590 - Exploratory Fishing in Lake Erie, September 1958-November 1959.

Sep. No. 591 - Research in Service Laboratories (June 1960): Contained this article--"Fish Flour is Primarily a Protein Concentrate-- Not a Substitute for Grain Flour."

Sep. No. 592 - Equipment Note No. 4 - A Method of Making Electrical Trawl Cable Terminations and Connections.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-17	- Italian Fishing Industry, 1959.
MNL-19	- Japanese Investments in Overseas Fishery Enterprises.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Average Year's Fishing Condition of Tuna Long-Line Fisheries, 1958 Edition, edited by Nankai Regional Fisheries Research Laboratory, 44 pp., processed. (Translated from Tokyo Federation of Japan Tuna Fishermen's Co-Operative Associations, 1959, text volume, pp. 1-27.)

Culturing of a Copepoda, SINOCALANUS TENELLUS, by Chikayoshi Matsudaira, 6 pp., processed. (Translated from Information Bulletin on Planktology in Japan, no. 5, 1957, pp. 1-6.)

Noise of Creatures in Sea in Region of Ultrasound, by Tomiju Hashimoto and Yoshinobu Maniwa, 15 pp., illus., processed. (Translated from Technical Report of Fishing Boat No. 12, 1958, pp. 99-114.)

On the Gill-Rakers of SARDINIA MELANOSTICTA (Temminck & Schlegel), by Noboru Sako, 2 pp., processed. (Translated from Bulletin of the Japanese Society of Scientific Fisheries, no. 7, 1938, pp. 237-238.)

The Study of Finding the Reasons Why the Bonito Does Not Take to the Angling-Baits, by Yasou Suyehiro, 12 pp., processed. (Translated from Journal of the Imperial Fisheries Experimental Station (Tokyo), no. 9, 1938, pp. 87-102.)

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS NOT FOR GENERAL DISTRIBUTION BUT IS AVAILABLE FOR REFERENCE ONLY FROM THE U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

Offshore Distribution of Plankton Produced in Coastal Water, by Masataka Kitou, 3 pp., processed. (Translated from Information Bulletin on Planktology in Japan, no. 5, 1957, pp. 7-8.)

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

California Fishery Products Monthly Summary March 1960; 13 pp. (Market News Service U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) Califor-

nia cannery receipts of tuna and tunalike fish; mackerel, and anchovies; pack of canned tuna, mackerel; and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, March 1960, 12 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, March 1960, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; sponge sales; and fishery imports at Port Isabel and Brownsville, Tex., from Mexico; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, April 1960, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Annual Summary, 1959, by John J. O'Brien, 51 pp., processed. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the fish marketing trends and conditions at the principal New England fishery ports, and highlights of fisheries in other nearby areas. Presents food-fish landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices by months for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and monthly landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange.

New England Fisheries--Monthly Summary, March, and April 1960, 22 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; indus-

trial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for January and March 1960, 16 and 22 pp. respectively. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on Wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the months indicated.

(New York) List of Primary Brokers and Importers of Fishery Products and Byproducts, New York City, 1959-1960, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York 38, N. Y.)

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, April 1960, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria, (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

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.

BRAZIL:

Pesca 1958 (Fisheries 1958), 16 pp., processed in Portuguese. Ministerio da Agricultura, Servico de Estatistica da Producao, Rio de Janeiro, Brazil, December 1959.

CALIFORNIA:

California Fish and Game, vol. 46, no. 2, April 1960, 124 pp., illus., printed. Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif. Includes, among others, these articles: "Exploratory Longline Fishing for Tunas in the Eastern Tropical Pacific, September 1955 to March 1956," by Kenneth F. Mais and Tom Jow; "Observations on the Growth Rate of the Spiny Lobster," by John Backus; "Age Composition of the Southern California Catch of Pacific Mackerel, *Pneumatophorus diego* for the

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1957-1958 Season," by Harold Hyatt; "Age and Length Composition of the Sardine Catch off the Pacific Coast of the United States and Mexico in 1957-58," by Anita Daugherty and Robert S. Wolf; "Notes on Four Specimens of the Pacific Sardine Taken in August 1957 off British Columbia and Oregon," by Charles F. Reid; and "An Economic Evaluation of California's Sport Fisheries," by John Mahoney.

Digest of Commercial Fish Laws, 1959-61, 28 pp., illus., printed. California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif., 1959. A booklet explaining the California commercial fishing laws. This booklet is not intended to replace the Fish and Game Code but to explain the Code to the fishing industry. It contains information on license provisions, species covered, the commercial fishing districts, provisions of the Code affecting the commercial fisheries, calendar of the seasons, and use or possession of nets in certain districts. Laws governing the catch of fish and shellfish are restrictive; those governing fishing gear are permissive.

A Field Guide to Some Common Ocean Sport Fishes of California, Pt. 1, by Daniel J. Miller, 40 pp., illus., printed. California Department of Fish and Game, Marine Resources Operations, Sacramento, Calif., 1960.

CANADA:

The Canadian Fish Culturist, no. 26, March 1960, 34 pp., illus., printed. The Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes the following articles: "Homing Behavior in Spawning Lake Trout," by N. V. Martin; "Further Observations on the Survival of Yearling Lake Trout Planted in South Bay, Lake Huron," by J. C. Budd and F. E. J. Fry; "Comparative Tagging Returns Employing Three Different Anaesthetics," by R. A. Ryder; "A Possible Source of Error in Assessing the Survival of Pacific Salmon Eggs by Redd Sampling," by J. G. McDonald; and "A Modified Roller Press for Scale Impressions," by M. H. Baker and H. H. Brohm.

CEYLON:

Administration Report of the Director of Fisheries for 1958, 80 pp., printed in Sinhalese and English. Government Publications Bureau, Colombo, Ceylon. February 1960.

CONNECTICUT:

A Fishery Survey of the Lakes and Ponds of Connecticut, 395 pp., illus., printed. State Board of Fisheries and Game, Lake and Pond Survey Unit, Hartford, Conn., 1959.

CONSERVATION:

The Exploitation and Conservation of the Resources of the Sea: A Study of Contemporary International Law, by Francisco V. Garcia Amador, second and enlarged edition, 226 pp., printed, Fl 26.75 (about US\$7.09). A. W. Sijthoff, Leliden, Netherlands, 1959. Presents a discussion of the work of the first United Nations Conference on the Law of the Sea held in Ge-

neva in the spring of 1958. The author believes that the recent advances in exploration and exploitation of the riches of the sea and the rise of new national needs and interests necessitate the making of adjustments in traditional international law. The emerging new system must recognize and secure "the legitimate interest of all in the rational utilization of the resources of the sea." The author discusses recent developments with regard to the continental shelf, territorial sea, contiguous zones, and the new baseline technique. He states the view that the plan adopted at Geneva in 1958 properly recognizes the rights and interests of both the coastal states and the nations traditionally fishing on the high seas.

CUBA:

Mar y Pesca, vol. 3, nos. 4, 5, and 6, January-March 1960, 50 pp., illus., printed in Spanish. Departamento de Pesca del I. N. R. A., Noveno Piso, Plaza Civica, Havana, Cuba. Includes, among others, these articles: "Industrializacion de la Pesca de Agua Dulce" (Commercial Development of the Fresh-Water Fishery), by Federico Gomez de la Maza; "Los Alimentos Marinos en su Aspecto Medicinal" (Seafood and Its Medicinal Potentiality); "Año del Pescado" (Seafood Year); "Adelantos Pesqueros en Jamaica" (Progress in Jamaica's Fisheries); "Probabilidad Comercial de la Sardina en Cuba" (Commercial Possibilities of the Cuban Sardine), by Armando Perez Gattini; "Cooperativas de Pescadores" (Fisherman's Cooperatives); "Visitando los Fondos de los Abismos Marinos" (Exploring the Depths of the Oceans); and "La Industria de la Pesca en Rusia" (The Russian Fishery Industry), by Fidel de Varona C.

DIRECTORIES:

Amendments to a Directory of White Fish Exporters in the United Kingdom, 4 pp., printed. White Fish Authority, Lincoln's Inn Chambers, 2-3 Cursitor St., London EC4, England.

ECHO-SOUNDING DEVICES:

"Fishing with Sound," by Yu. A. Shemanskiy, article, Priroda, no. 2, pp. 104-105, printed in Russian. Priroda, Akademiya Nauk SSSR, M. Khariton'yevski per. 4, Moscow, U.S.S.R., 1958.

EELS:

"The Atlantic Eel Problem," by C. L. Deelder and Denys W. Tucker, article, Nature, vol. 185, no. 4713, February 27, 1960, pp. 589-592, printed. Nature, MacMillan & Co., Ltd., St. Martin's St., London WC2, England.

ELECTRICAL FISHING:

The Development and Evaluation of Interrupted Direct Current Electro-Fishing Equipment, by Max Dean Rollefson, Cooperative Research Project No. 1, 123 pp., illus., processed. Colorado Cooperative Fisheries Research Unit, 243 Forestry Bldg., Colorado State University, Fort Collins, Colo., May 1958. This project was conducted jointly by the Colorado

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State University, Wyoming Game and Fish Commission, and Colorado Game and Fish Department. Quantitative evidence of electrofishing success under field conditions with direct current, alternating current, and pulsed direct current was compared. In addition, electrocution experiments were performed to ascertain the approximate minimum lethal exposure periods of carp to electric fields of several conditions of alternating current voltage and current density.

"A Direct-Current Electrofishing Apparatus Using Separate Excitation," by A. R. Murray, article, The Canadian Fish Culturist, no. 23, pp. 27-32, printed. The Canadian Fish Culturist, Department of Fisheries, Ottawa, Canada, 1958.

EUROPEAN ECONOMIC COOPERATION:

Seefischerei und Außenhandel mit Fischen und Fischwaren der OEEC-Länder im Hinblick auf die Europäische Wirtschaftsgemeinschaft (Gemeinsamer Markt) und den Europäischen Freihandelsbund (Marine Fisheries and Foreign Trade in Fish and Fishery Products of the OEEC Countries with Special Reference to the European Common Market and the European Free Trade Area), by Wilhelm Blanke, 156 pp., processed in German. Forschungsstelle für Fischereiwirtschaft, Bremer Ausschuss für Wirtschaftsforschung, Parkstrasse 50, Bremen, Germany, 1959.

FISH POPULATIONS:

"Estimation of Fish Populations," by J. A. Timmermans, Travaux de Station de Recherches, Series D. Hydrobiologie, No. 21, 84 pp., printed in French. Groenendael Station de Recherches, Jette, Belgium.

FISH PROCESSING INDUSTRIES:

1958 Census of Manufactures--Cured Fish Industry, Industry and Product Reports No. MC(P)-20C-1, 4 pp., processed, 10 cents. Bureau of the Census, U. S. Department of Commerce, Washington 25, D. C., February 1960. Advance information on industries and products covered in the 1958 Census of Manufactures, to be superseded by a final report which will be included in vol. II, Industry Statistics. Describes firms reporting, value of production, general statistics, and publication program and background for this census. Statistical tables are included on employment in the cured fish industry, 1958 and 1954, and quantity and value of cured fish produced by all producers in the United States for the same period.

FISH SILAGE:

Ensilado de Pescado, Variaciones en la Fuente Energetica (Fish Silage, Variations in the Source of Energy), by Victor H. Bertullo and Fernando Perez Hettich, 12 pp., illus., printed in Spanish with brief English summary. (Reprinted from Anales de la Facultad de Veterinaria, vol. 8, no. 6, August 1959, pp. 121-132.) Facultad de Veterinaria, Montevideo, Uruguay.

FLORIDA:

Notes on the Marine Flora of the Marquesas Keys, Florida, by Ronald C. Phillips, Contribution

No. 35, 8 pp., illus., printed. State Board of Conservation, Marine Laboratory, St. Petersburg, Fla., 1959.

FOOD AND AGRICULTURE ORGANIZATION: Approved Budget 1960-61 as Approved by the Conference at Its 10th Session, 63 pp., printed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1960.

FRANCE:

"La Campagne du President-Theodore-Tissier a l'Ouest et au Nord-Ouest des Iles Britanniques" (The Cruise of the President Theodore Tissier to the West and Northwest of the British Isles), article, La Peche Maritime, vol. 39, no. 985, April 1960, pp. 220-222, illus., printed in French. La Peche Maritime, 190 Boulevard Haussmann, Paris, France.

FRESH-WATER FISH:

Survival and Migration of Fresh-Water Fishes in Salt Water, by William C. Renfro, Contribution No. 44, 9 pp., illus., printed. (Reprinted from The Texas Journal of Science, vol. 11, no. 2, June 1959, pp. 172-180.) Texas Game and Fish Commission, Seabrook, Tex.

"The Tolerance of Some Fresh-Water Fish for Sea Water," by D. W. M. Herbert and H. T. Mann, article, The Salmon and Trout Magazine, no. 153, pp. 99-101, printed. The Salmon and Trout Association, Fishmongers' Hall, London Bridge, London EC4, England, 1958.

FROZEN FISH:

"Comercio y Consumo de Pescado Congelado en los Paises de la O.E.C.E." (Trade and Consumption of Frozen Fish in the O.E.E.C. Countries), article, Industrias Pesqueras, vol. 34, no. 790, March 15, 1960, pp. 90-91, printed in Spanish. Industrias Pesqueras, Policarpo Sanz, 21-2º, Vigo, Spain.

GEAR:

Relative Selectivity of Freshwater Commercial Fishing Devices Used in Louisiana, by James Davis and Lloyd Posey, Jr., 27 pp., illus., printed. Fisheries Section, Wild Life and Fisheries Commission, Wildlife and Fisheries Bldg., 400 Royal St., New Orleans, La., 1959.

GENERAL:

Journal du Conseil, vol. 25, no. 1, October 1959, 106 pp., illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark. Includes, among others, these articles: "The Multiplane Kite-OTter as a Depressor for High-Speed Plankton Samplers," by John B. Colton, Jr.; "A Quantitative Multiple Opening-and-Closing Plankton Sampler for Vertical Towing," by Allan W. H. Be, M. Ewing, and L. W. Linton; "The Scientific Name of the Common Cod," by Daniel M. Cohen; "How the Tag Return Rate is Affected by the Condition of Fish When Tagged," by R. J. H. Beverton, J. A. Gulland, and A. R. Margetts; "A Method of Analysis of

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Some Tagged Haddock Returns," by R. Jones; "Fecundities of Winter-Spring and Summer-Autumn Herring Spawners," by I. G. Baxter; "Otolith Types Amongst Summer-Autumn Spawning Herring in the Northern North Sea," by B. B. Parrish and D. P. Sharmar; and "Temperature and Growth--The Pacific Razor Clam," by Clyde C. Taylor.

"Some Simple Mathematical Models as Aids in Interpreting the Effect of Fishing," by Kenneth D. Carlander, article, Iowa State College Journal of Science, vol. 32, no. 3, pp. 395-417, printed. Iowa State College, Ames, Iowa, 1958.

GREECE:

"Alarma en Grecia ante la Competencia Pesquera Japonesa" (Greek Concern over Japanese Fishery Competition), by E. Simos, article, Puntal, vol. 7, no. 70, January 1960, p. 20, printed in Spanish. Puntal, Ramon y Cajal, 3, Apartado 316, Alicante, Spain.

HONG KONG:

Hong Kong Annual Departmental Reports by the Director of Agriculture, Fisheries & Forestry (for the Financial Year 1958/59), 102 pp., illus., printed, HK\$4 (about 70 U. S. cents). Government Press, Java Road, Hong Kong. Contains the annual reports of the various divisions of the Department of Agriculture, Fisheries, and Forestry. Included in the report of the Fisheries Division is a review of its activities during the year, which were directed chiefly to the marine fisheries and mechanization of the fleet, fishery investigations, fisheries education, fresh-water fisheries, loans to fish farmers, and oyster and pearl culture. Statistical data are included on mechanization of new vessels during 1958/59, landings and value of fish landed in Hong Kong, and other pertinent information.

Hong Kong Annual Departmental Reports by the Registrar of Co-Operatives and Director of Marketing (for the Financial Year 1958/59), 47 pp., illus., printed, HK\$3.50 (about 61 U. S. cents). Government Press, Java Road, Hong Kong. Discusses the cooperative societies, credit facilities, and marketing organizations provided in the Colony for the fishermen and farmers. The section covering the Government-sponsored Fish Marketing Organization includes information on legislation; species of fish marketed and exported; the mechanized fishing fleet; wholesale markets; the marketing of shrimp; transportation of fish; education of fishermen and their children; and financial assistance to fishermen.

IMPORTS:

United States Imports of Merchandise for Consumption (Commodity by Country of Origin), Calendar Year 1959, Report No. FT 110, 193 pp., processed, \$1. Bureau of the Census, U. S. Department of Commerce, Washington, D. C., April 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) The import statistics include government as well as nongovernment

shipments of merchandise (including fish, shellfish, and fishery byproducts) from foreign countries.

ISRAEL:

Fishermen's Bulletin, vol. 3, no. 3 (23), March 1960, 36 pp., illus., printed in Hebrew with English abstracts. Fishermen's Bulletin, Ministry of Agriculture, Division of Fisheries, Sea Fisheries Research Station, P. O. B. 699, Haifa, Israel. Contains, among others, articles on "Exploratory Trawling in the Neighborhood of Cyprus," by A. Ben-Tuvia, O. H. Oren, and M. Ben-Yami; "Sardinella Fishery During the Year 1959 and the Forecast for the Year 1960," by A. Ben-Tuvia; "Underwater Television and Fisheries," by E. Gottlieb; "A Motor-Boat for Sardine Fishing," by J. Bejerano; and "The Kishon Fishing Harbour," by Z. Fried.

ITALY:

"Industria de la Pesca en Italia" (Italy's Fishing Industry, 1951-57), article, Boletín de Información, no. 15, December 1959, pp. 14-16, printed in Spanish. Sindicato Nacional de Pesca, Paseo del Prado, 18-20, 6^a Planta, Madrid, Spain.

JAMAICA:

"FAO Report Points Way to Future Fisheries Development," article, The Caribbean, vol. 14, no. 2, February 1960, pp. 30-31, illus., printed. The Central Secretariat, Caribbean Commission, Kent House, Port-of-Spain, Trinidad, B.W.I. Discusses the report on the mechanization of fishing boats in Jamaica, recently published by the Food and Agriculture Organization of the United Nations in Rome. Points covered include proposals for improved design and operation of fishing vessels; the prototype 35-foot boats being designed; and the training program for fishermen.

JAPAN:

Technical Report of Fishing Boat, No. 14, March 1960, 217 pp., illus., printed in Japanese with English abstracts. Fishing Boat Laboratory, Production Division, Fisheries Agency, Ministry of Agriculture and Forestry, Kasumigaseki, Chiyodaku, Tokyo, Japan. Contains, among others, articles on: "Self-Propulsion Test in Waves with European Wooden Trawlers," by N. Yokoyama, T. Kobayashi, and E. Imanari; "Anticorrosion of a Propeller (The Practical Test of Neoprene Coating for a Propeller Shaft Part 1)," by R. Hata, K. Kusama, and T. Yamada; and "The Measurement of Shapes of One-Boat Trawl Nets Operated in Mid-Water Layer and the Catch Results with the Aid of the Depth Telemeter Trially Manufactured," by C. Hamuro and K. Ishii.

JELLYFISH:

The Occurrence of the Jellyfish CHIROPALMUS QUADRUMANUS in Matagorda Bay, Texas, by William C. Guest, Contribution no. 46, 5 pp., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 9, no. 1, March 1959, pp. 70-83.) Texas Game and Fish Commission Laboratory, Rockport, Tex.

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2nd United Nations Conference on the Law of the Sea, United Nations, New York, N. Y.

The following processed reports are available from the United Nations, New York, N. Y., distribution limited:

A/CONF.19/C.1/L.1., Union of Soviet Socialist Republics: proposal to the Committee of the Whole, 1 p., March 21, 1960.

A/CONF.19/C.1/L.2., Mexico: proposal to the Committee of the Whole, 4 pp., March 21, 1960.

A/CONF.19/C.1/L.3., USA: proposal to the Committee of the Whole, 4 pp., March 23, 1960.

A/CONF.19/C.1/L.4., Canada: proposal to the Committee of the Whole, 1 p., March 24, 1960.

A/CONF.19/L.1., Adoption of the rules of procedure, Mexico: amendments to the provisional rules of procedure (A/CONF.19/2.), 5 pp., March 16, 1960.

A/CONF.19/L.2., Officers of the Conference, 1 p., March 22, 1960.

The following processed reports are available from the International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.:

A/CONF.19/5., Supplement to Laws and Regulations on the Regime of the Territorial Sea, UN Legislative Series, 36 pp., February 10, 1960.

A/CONF.19/6., Supplement to the Bibliography Guide to the Law of the Sea (A/CONF.13/17.), 27 pp., February 16, 1960.

A/CONF.19/7., Rules of Procedure, as adopted by the Conference, 18 pp., March 18, 1960.

LOUISIANA:

"Requirements for Taking Fresh Water Commercial Fish in Louisiana," article, Louisiana Conservationist, vol. 12, nos. 2-3, February-March 1960, pp. 19-20, printed. Louisiana Wild Life and Fisheries Commission, Wildlife and Fisheries Bldg., 400 Royal St., New Orleans, La.

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"Some Economic Aspects of Control by Quota," by W. C. MacKenzie, article, Canadian Fish Culturist, no. 22, pp. 21-24, printed. Canadian Fish Culturist, Department of Fisheries, Ottawa, Canada, 1958.

"Some Sociological Effects of Quota Control of Fisheries," by J. L. Hart, article, The Canadian Fish Culturist, no. 22, pp. 17-19, printed. The Canadian Fish Culturist, Department of Fisheries, Ottawa, Canada, 1958.

MARLIN:

"Races of the Striped Marlin, Makaira mitsukurii, in the Pacific," by James E. Morrow, article, Bulletin of the Bingham Oceanographic Collec-

tion, vol. 16, no. 2, pp. 72-87, printed. Peabody Museum of Natural History, Yale University, New Haven, Conn., 1957.

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Sea Shells of Tropical West America. Marine Mollusks from Lower California to Columbia, by A. Myra Keen, illus., printed, E 5 (about US\$14.05). Stanford University Press, Stanford University, Calif.

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Atlas Rybachi Morza Polnocnego (Fishing Atlas of the North Sea), by A. Klimaj St. Rutkiewicz, 37 charts, printed in Polish. Morski Instytut Rybacki, Gdynia, Poland, 1957.

NORWAY:

"Merkeforsøk pa Brisling 1959" (Tagging of Brisling 1959), article, Fiskets Gang, vol. 46, no. 12, March 24, 1960, pp. 178-182, illus., printed in Norwegian. Fiskets Gang, Postgiro 691 81, Bergen, Norway.

"Norges Fiskerier 1959" (Norwegian Fisheries 1959), article, Fiskets Gang, vol. 45, no. 53, December 31, 1959, pp. 706-710, printed in Norwegian with table in English. Fiskets Gang, Postgiro nr. 691 81, Bergen, Norway. Includes statistical data on quantities and values of principal species landed in Norway during 1959.

"Smatralernes Fiske i 1958" (Small Trawler Fishery in 1958), by Sverre Mollestad, article, Fiskets Gang, vol. 46, no. 10, March 10, 1960, pp. 146-152, illus., printed in Norwegian. Fiskets Gang, Postgiro nr. 691 81, Bergen Norway.

"Vintersildfiskets Lønnsomhet 1959" (Production of the Winter Herring Fishery 1959), by Georg Oppedal, article, Fiskets Gang, vol. 46, no. 9, March 3, 1960, pp. 125-136, illus., printed in Norwegian. Fiskets Gang, Postgiro nr. 691 81, Bergen, Norway.

OYSTERS:

The Texas Oyster Fishery, by Robert P. Hofstetter, Bulletin No. 40, Series No. 6, 44 pp., illus., printed. Texas Game and Fish Commission, Austin, Tex., August 1959. An illustrated booklet describing in detail the biology of the oyster, the oyster reef, cultivation or "farming," and the Texas oyster lease. The section on the industry discusses methods of harvesting, processing, and the annual harvest from the bay areas of Texas.

PARASITES:

Another Species of MICROPALLUS Ward, 1901, from the Pink Shrimp, PENAEUS DUORARUM Burkenroad, by Robert F. Hutton, Franklin Sogandares-Bernal, and Bonnie Eldred, Contribution No. 27, 1 p., illus., printed. State Board of Conservation, Marine Laboratory, St. Petersburg, Fla., 1959.

The Identity of Metacecaria B Reported from the Pink Shrimp, PENAEUS DUORARUM Burkenroad, by Woodburn et al in 1957, by Franklin

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Sogandares-Bernal and Robert F. Hutton, Contribution No. 17, 2 pp., illus., printed. State Board of Conservation, Marine Laboratory, St. Petersburg, Fla., 1959.

PERU:

"Observations on the Biology of Anchovy (*Engraulis ringens* J.) in the Haucho Fishery Zone," by Romulo Jordan S., article, *Boletim da Companhia Administradora del Guano*, vol. 35, no. 11, November 1959, pp. 3-22, tables 1-5, printed in Spanish. Companhia Administradora del Guano, Casilla 2147, Lima, Peru.

"Peru Has Over Sixty Fish Meal Plants," article, *The South African Shipping News and Fishing Industry Review*, vol. 15, no. 3, March 1960, pp. 83, 85, printed. *The South African Shipping News and Fishing Industry Review*, Odhams Press, South Africa (Pty.), Ltd., P. O. Box 2598, Cape Town, Union of South Africa. Describes how Peru increased its fish production nearly thirtyfold in ten years and how the fish meal industry was developed to the point where Peru is now one of the world's leading exporters of fish meal.

PESTICIDES:

"Toxic or Non-Toxic to Fish?," by H. J. Bandt, article, *Deutsche Fischerei Zeitung*, vol. 4, pp. 170-171, printed in German. *Deutsche Fischerei Zeitung*, Berlin-Friedrichshagen, Muggelseedamm 310, East Berlin, Germany, 1957.

"The Toxicity of Insecticidal and Acaricidal Agents to Fish," by K. G. Adlung, article, *Naturwissenschaften*, vol. 44, pp. 471-472, printed in German. *Naturwissenschaften*, Springer-Verlag, Reichpietschufer 20, Berlin W. 35, Germany, 1957.

"The Toxicity of Insecticides to Fish and Its Dependence on Temperature," by K. G. Adlung, article, *Naturwissenschaften*, vol. 44, pp. 622-623, printed in German. *Naturwissenschaften*, Springer-Verlag, Reichpietschufer 20, Berlin W. 35, Germany, 1957.

PHILIPPINES:

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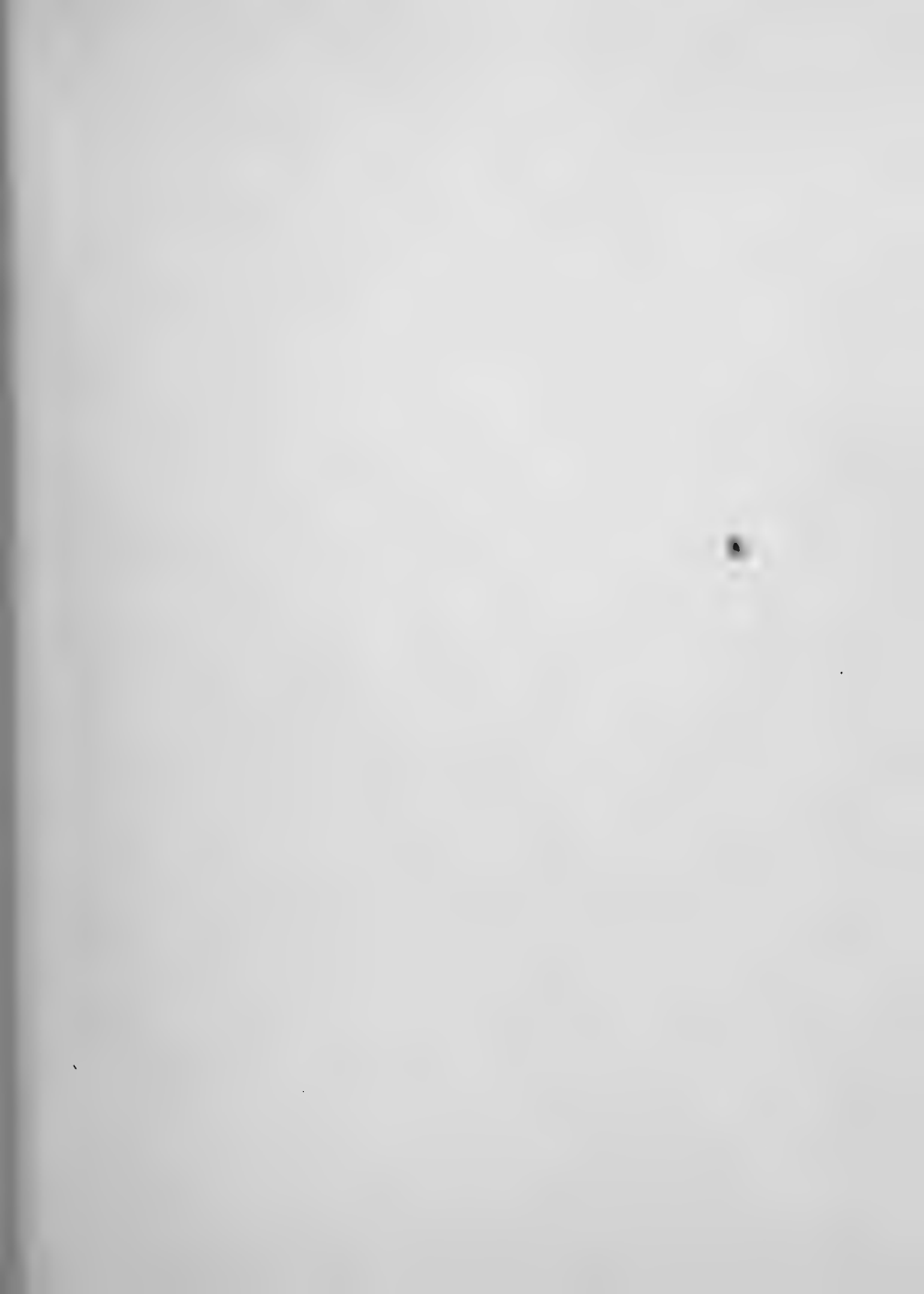
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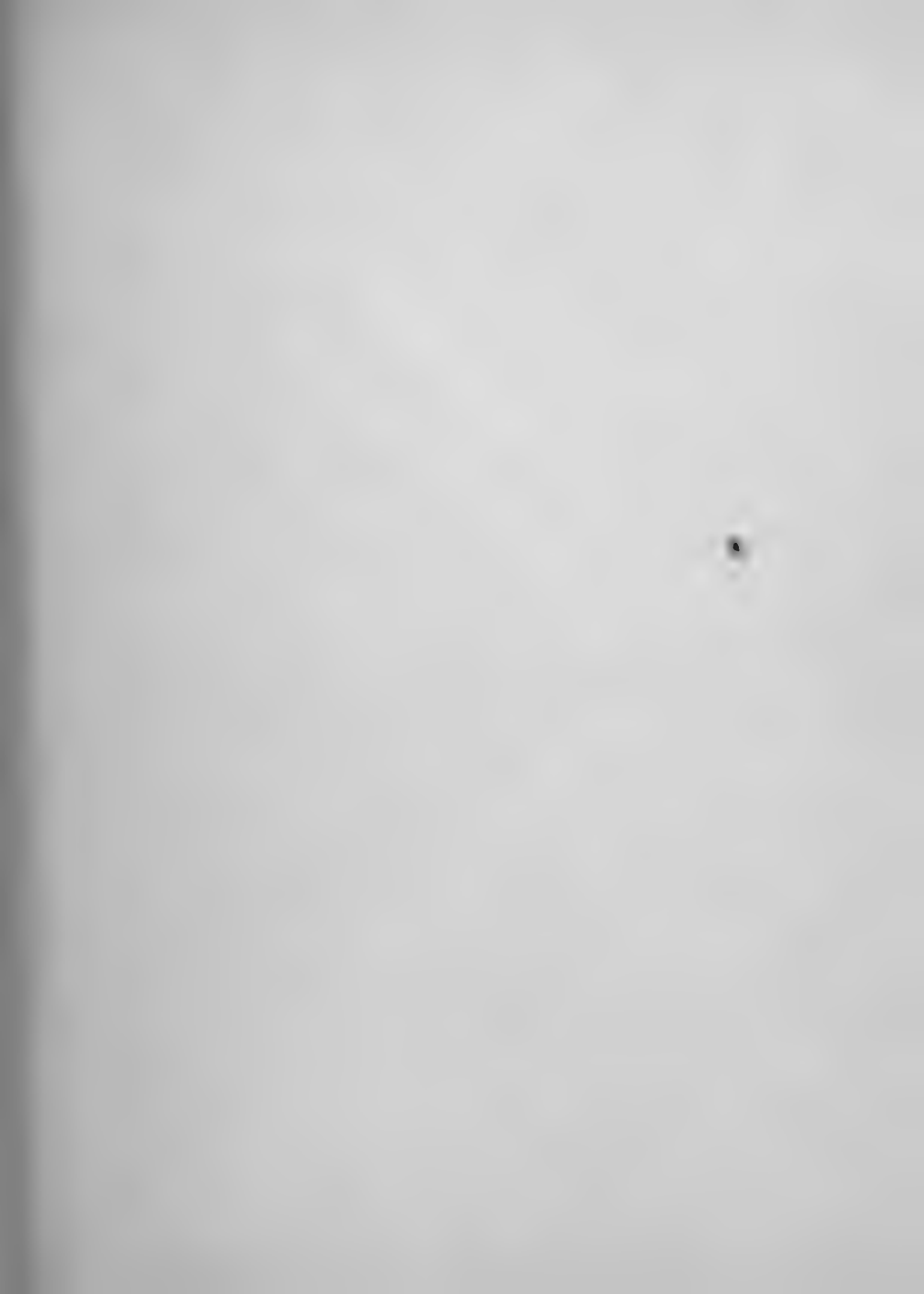
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CANNED SHRIMP FOR QUICK MEALS

Although the shrimp fishery extends all the way from North Carolina to Texas on the Atlantic and Gulf coasts and from California to Alaska on the Pacific coast, canning operations are concentrated principally in the colorful bayou country of the Alabama, Mississippi, Louisiana, and Texas coasts in such picturesquely named cities as Bayou La Batre, Biloxi, Dulac, Chauvin, Golden Meadow, Houma, and Westwego. The North Pacific canning operation is relatively new but is bringing to the American housewife the delectable and dainty cocktail shrimp.

Canned shrimp are available in 4½-, 5-, and 7-ounce cans, either packed in brine or dry. They are easy to store and require little or no preparation, a real convenience in these hot weather days. All that is required is to remove the shrimp from the can, wash in cold water, and proceed with the recipe.

The home economists of the U. S. Bureau of Commercial Fisheries, suggest the following recipes:

SHRIMP THERMIDOR

2 cans (4½ or 5-oz. each) deveined shrimp	½ teaspoon powdered mustard
1 can (4-oz.) sliced mushrooms, drained	Dash cayenne pepper
¼ cup butter or margarine, melted	2 cups milk
¼ cup flour	Grated Parmesan cheese

Paprika

Drain shrimp. Rinse in cold water. Drain. Cut large shrimp in half. Fry mushrooms in butter for 5 minutes. Blend in flour and seasonings. Add milk gradually and cook until thick, stirring constantly. Stir in shrimp. Place shrimp mixture in 6 individual, well-greased shells or 6-ounce custard cups. Sprinkle with cheese and paprika. Bake in a hot oven, 400° F., for 10 minutes or until cheese browns. Serves 6.

SHRIMP FONDUE

2 cans (4½ or 5-oz. each) deveined shrimp	3 eggs
8 slices white bread	¼ teaspoon powdered mustard
2 tablespoons butter or margarine	Dash pepper
3 tablespoons chopped green pepper	2 cups milk
1 cup grated cheese	Paprika

Drain shrimp. Rinse in cold water. Drain. Cut large shrimp in half. Remove crusts from bread and butter bread. Place 4 slices in a well-greased baking pan, 8 x 8 x 2 inches. Cover with layer of shrimp, green pepper, and half of the cheese. Top with remaining slices of buttered bread and cheese. Combine eggs, mustard, and pepper; beat with a rotary egg beater. Add milk; pour over sandwiches. Sprinkle with paprika. Bake in a slow oven, 325° F., for approximately one hour or until fondue is firm in the center. Serves 6.

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Fishes

ROBERT H GIBBS JR

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COMMERCIAL FISHERIES REVIEW



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

Joseph Pileggi, Editor
H. M. Bearse, Assistant Editor

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5/31/63

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CONTROL OF IRON SULFIDE DISCOLORATION IN CANNED SHRIMP (*Xiphopeneus* sp.) - PART 1

By Mary H. Thompson* and Melvin E. Waters**

ABSTRACT

The shrimp, seabob, has a short shelf life when canned, owing to discoloration of the can surface by iron sulfide. A study was made to determine whether a decrease in the pH of the can contents would prevent this discoloration. The pH was lowered in the experiments by the addition of either a lemon juice concentrate or a citric acid solution, the condition of the cans was noted after storage periods of varying lengths, and the data were interpreted in terms of efficiency of the additive and effectiveness of varying degrees of acidity in preventing the discoloration. Recommended canning techniques for seabob are discussed.

INTRODUCTION

For many years attempts have been made to utilize certain species of shrimp, commonly known as seabob, *Xiphopeneus* sp., for canning purposes, only to find that regardless of the freshness of the shrimp at the time of canning, the canned product had an extremely short shelf life. These shrimp cause an iron sulfide discoloration or blackening of the exposed metal surfaces of the can, which gradually spreads over the entire surface and eventually causes the shrimp themselves to discolor (Gallagher not dated).

Seabobs are found in commercial quantity in shallow waters of the Gulf of Mexico. The term seabob originated in the French name for this species, "six baub," which referred to the six sharp points on the rostrum of this species. The shrimp are of small size (70 to 80 count in the raw headless state) and are characterized by a very long upturned rostrum and long antennae, with the two posterior walking legs elongated into antennae-like filaments (Guest 1956).

In the Louisiana Delta area seabobs have long been salted and sun-dried. At various times they have been used to prepare shrimp meal. The supply of these shrimp far exceeds the demand for them, and consequently attempts have been made

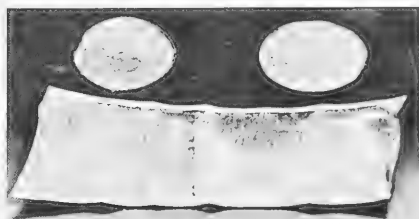


Fig. 1 - Severe iron sulfide discoloration present on can surfaces in control Lot No. 1 after a storage period of 360 simulated days.

Technological Laboratory, Division of Industrial Research,
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* Chemist
** Fishery Products Technologist

to process the seabobs in several types of cans when other shrimp are in short supply. However, the shelf life of the canned product has always been short, particularly at warm storage temperatures.

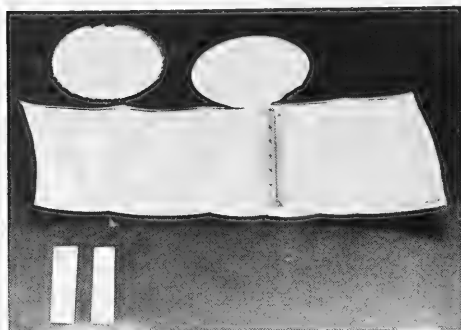


Fig. 2 - Absence of iron sulfide discoloration on can surfaces after a storage period of 360 simulated days.

The average pH of well-iced seabobs is 7.5 when measured immediately after picking, whereas the average pH of well-iced shrimp of other Gulf commercial species at that time is 7.0. In other commercial species of shrimp a pH of the canned product exceeding 7.2 will allow iron sulfide discoloration. The difference in the normal pH of the two types of shrimp in the raw state, and the corresponding difference to be expected in the canned product, has led to experimentation in the lowering of the pH of the canned product in an effort to reduce the iron sulfide discoloration of the can and its contents.

The present series of experiments were initiated to determine if pH was the primary factor involved in the case of seabobs, and if so, what additives could be used to prevent such blackening. In general, this discussion should be considered as the first part of a series of experiments, and later reports will deal with the effect of other additives upon the discoloration and comparisons of the effectiveness of the additives in dealing with this problem. Because both citric acid and lemon juice concentrate have been suggested as additives to control this discoloration, it was decided to test their relative effectiveness in the first experiment of the series. The present series of tests were conducted at higher storage temperatures; however, further storage studies at normal temperatures are contemplated. A secondary aim was to suggest a possible time limit on the shelf life of such products. In the course of these experiments, a satisfactory method of processing these smaller shrimp was also developed.

The first portion of this paper deals with the initial experiments undertaken in an effort to find the proper amount of each additive to be used. Subsequently, the results of a larger-scale pack to determine the effectiveness of the two additives used, the increase in shelf life to be expected, and the effect of lowering the pH of the can contents is reported. Finally, the processing method developed for use with these smaller shrimp is outlined.

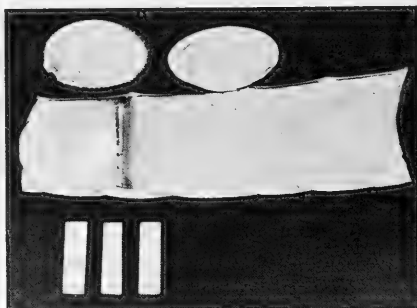


Fig. 3 - Iron sulfide discoloration present in slight amounts on can surfaces after a storage period of 360 simulated days.

INITIAL EXPERIMENT

PROCEDURE: Processing Method: The following method was used in processing the shrimp in all of the experiments:

1. The shrimp were peeled, blanched in boiling 8-percent salt solution for 2 to 3 minutes, drained, and packed with 5.25 ounces of meats to the can. Number 211 x 300 shrimp cans, coated with C-enamel of the type commonly used by the shrimp canning industry, were used throughout. This method produced a drained weight of 4.75 ounces or more.

2. The can was filled to $\frac{1}{4}$ -inch headspace (80 to 85 ml. of solution) with brine or brine plus additives and sealed at a temperature of 150° F.

3. The cans and contents were processed for 12 minutes at 250° F. and 15 pounds pressure, and water-cooled before storage.

Scoring Method for Evaluating Discoloration: The scoring method used in estimating the amount of iron sulfide discoloration is as follows:

- (1) Score 0 - no iron sulfide discoloration
- (2) Score 0+ - very slight iron sulfide discoloration (area of deposit - 4 mm.² or less)
- (3) Score 1 - slight iron sulfide discoloration (area of deposit - 4 to 36 mm.²)
- (4) Score 2 - moderate iron sulfide discoloration (area of deposit 36 to 81 mm.²)
- (5) Score 3 - heavy iron sulfide discoloration (area of deposit, more than 81 mm.²)

Experimental Method: Preliminary experiments were conducted with two levels of lemon juice concentrate and two levels of citric acid in an effort to determine the most effective concentration of each in retarding the iron sulfide discoloration. The shrimp were received well-frozen and headless, were thawed and peeled by hand, and were processed according to the method previously described. In this preliminary experiment, salt tablets were used instead of brine to follow local commercial practice. The tablet was later discarded in favor of brine, which was easier to handle under the conditions of this study. The pack was divided into the following classifications depending upon the type of solution used to fill the container:

1. Control - 4.8 g. salt plus water
2. Type 1 - 4.8 g. salt plus 1 part lemon juice concentrate No. 309 to 50 parts water
3. Type 2 - 4.8 g. salt plus 1 part lemon juice concentrate No. 309 to 25 parts water
4. Type 3 - 4.8 g. salt plus 0.26 g. citric acid (equivalent to a 0.33-percent citric acid solution)
5. Type 4 - 4.8 g. salt plus 0.33 g. citric acid (equivalent to a 0.41-percent citric acid solution)

This canned lot was stored at a constant temperature of 37.5° C. (98.6° F.) for 70 days. High storage temperatures, such as were used in these experiments, intensify chemical reactions in the can. The higher temperatures used in this study were the only known deviation from the normal commercial canning procedure. There is a rule of thumb that the rate of chemical reactions approximately doubles for every 10° C. increase in temperature. Thus, the changes which occur during a given storage time are effectively doubled if the product is stored at 37.5° C. (99.5° F.) rather than at usual warehouse temperatures of 27.5° C. (81.5° F.) For example, a lot with a storage period of 70 days under forced conditions is approximately equal to one with a 140-day period under normal conditions. Since there has not been a study of the kinetics of this particular reaction in

relation to time and temperature, the figures used to indicate simulated storage days are only approximate ones based on the aforementioned rule of thumb. At the end of 140 and 280 simulated days the cans were opened, the amount of discoloration was noted, and the pH of the contents was determined with a pH meter.

RESULTS: Lemon juice in both concentrations was still effective at the end of 140 days and 280 days of simulated storage in retarding the discoloration. It appeared, however, that as discoloration was occasionally evident in the cans of 1:50 dilution, a slightly stronger concentration was needed, but one not as strong as the 1:25 dilution. At the same time, it appeared that neither the 0.26- nor the 0.33-gram concentrations of citric acid in the can were adequate to prevent discoloration. It was then decided to repeat the experiment on a larger scale, using a 1:40 dilution of lemon juice concentrate No. 309 and a concentration of 0.52 g. of citric acid per can.

PILOT-SCALE PACKING OF SHRIMP

PROCEDURE: It was necessary to process a large number of cans to determine the relative effectiveness of the proposed strengths of the two additives and to determine whether the relative acidity of the can contents, as indicated by the pH value, was a controlling factor in eliminating the discoloration.

One lot of seabobs was obtained from the Houma, La., area, where they had been peeled in an automatic shrimp peeler. They had been kept well-iced from capture until processing the following day, at which time the average pH of the raw shrimp was 7.5. The entire pack was divided into three smaller lots:

1. Lot No. 1 - Control, contained 80 to 85 ml. of 8.1 percent brine per can.
2. Lot No. 2 - Lemon juice, contained 80 to 85 ml. of 1 part lemon juice concentrate No. 309 to 40 parts of 8.1-percent brine per can.
3. Lot No. 3 - Citric acid, contained 80 to 85 ml. of 0.65-percent reagent-grade citric acid in 8.1-percent brine solution per can (0.52 g. of citric acid per can)

The cans were sealed, processed, and scored according to the general method outlined in the previous section. The 1:40 dilution of lemon juice concentrate No. 309 used, provides a concentration of citric acid in the can between 0.55 and 0.66 g. The pH of the 1:40 lemon juice solution was 2.8 and that of the citric acid solution was 2.7. Lots Nos. 1, 2, and 3 were stored at 47.5 °C. (117.5 °F.) for a 90-day period, which in effect was a simulated storage period of 360 days at normal temperatures. The day following that of processing, a can of each lot was cut, and a pH reading was taken to provide a base measurement. The pH of Lot No. 1 was 8.12; Lot No. 2, 6.42; and Lot No. 3, 6.40.

RESULTS: Since this was an experiment of a self-destructive nature in that when one can was cut it was lost as far as further storage studies were concerned, it seemed more valuable to simulate a storage period of approximately 1 year and to determine the condition of the cans and contents at the end of that time.

In order that an indication of the progress of the experiment could be provided, four cans from each lot were cut at the end of 220 simulated days. The results of this cutting are shown in table 1. The blackened condition of the cans in Lot No. 1, the control group, was marked, and the average pH was 7.57. The cans from Lot No. 2, 1:40 lemon juice, were not discolored and had an average pH of 5.96. Those cans from Lot No. 3, 0.65-percent citric acid, were slightly discolored and had an average pH of 6.42.

Table 1 - Condition and pH Values of Canned Shrimp Stored at 47.5° C. (117.5° F.)

Samples	220 Simulated Days					360 Simulated Days				
	No. Cans Opened	pH Range	pH Avg.	Score	Total No. Cans With Score	No. Cans Opened	pH Range	pH Avg.	Score	Total No. Cans With Score
					Percent					Percent
Control: Shrimp meats, 8.1-percent brine	4	7.50-7.60	7.57	3	100	47	7.29-7.52	7.37	3	100
Lemon Juice: Shrimp meats, 8.1-percent brine, 1:40 lemon juice concentrate No. 309	4	5.80-6.12	5.96	0	100	22	5.62-6.24	6.01	0	51
						6	6.11-6.21	6.18	0-	14
						15	6.10-6.30	6.19	1	13
Citric Acid: Shrimp meats, 8.1-percent brine, 0.65 percent citric acid	4	6.35-6.50	6.42	1	100	7	6.18-6.59	6.41	0	17
						16	6.19-6.51	6.35	0-	38
						16	6.15-6.51	6.38	1	38
						3	6.60-6.63	6.61	2	7

At the end of 90 actual days, or 360 simulated days, the remainder of the cans in each of the lots were cut, the discoloration evaluated, and the pH measured. The results of this cutting are also shown in table 1. In control Lot No. 1, totaling 47 cans, all of the cans were heavily discolored. The pH ranged from 7.29 to 7.52 and averaged 7.37. In 68 percent of the cans this discoloration was so heavy that it permeated the shrimp meats.

In Lot No. 2 (1:40 lemon juice), totaling 43 cans, 51 percent of the cans showed no discoloration, 14 percent showed very slight discoloration, and 35 percent showed slight discoloration. The pH of those cans with no discoloration ranged from 5.62 to 6.24, average 6.01; those with very slight discoloration ranged from 6.11 to 6.21, average 6.18; and those with slight discoloration ranged from 6.10 to 6.30, average 6.19.

In Lot No. 3 (0.65-percent citric acid), totaling 42 cans, 17 percent of the total showed no discoloration, 38 percent of the cans were very slightly discolored, 38 percent were slightly discolored, and 7 percent were heavily discolored. The pH of those cans with no discoloration ranged from 6.18 to 6.59, average 6.41; those with very slight discoloration ranged from 6.19 to 6.51, average 6.35; those that were slightly discolored ranged from 6.15 to 6.51, average 6.38; and the heavily discolored cans ranged in pH from 6.60 to 6.69, average 6.63.

DISCUSSION: Discoloration was present on the can surface either in the headspace or beneath the surface of the contents. The blackening appeared first at those places where there was evidence of a break in the C-enamel. Kohman and Sanborn (1928) noted that in cans with enameled surfaces, the actions on the can surfaces are enormously concentrated at the point where the enamel has been pierced. As reactions take place in the can, the entire amount of tin plate is removed from this small surface area, allowing the sulfides present in the canned product to react with the exposed steel surface and produce the black iron sulfide discoloration. Since beginning discoloration surrounds a break in the enamel, it starts most often at the can seam or junction of the can lid and can body. As discoloration becomes more pronounced, the blackening extends under the enamel until it almost entirely covers the inside surface of the can. Since the cans were kept in one position throughout the entire storage period, it appeared that the discoloration could take place either in the headspace or on surfaces directly in contact with the can contents. This would indicate that the unwanted chemical reactions are taking place in the can's contents, as well as in the headspace of the can, contrary to previous experience with some other seafoods. The corrosion mechanism of tin plate is believed to be a function of the particular food product being dealt with, however, and results cannot always be extrapolated from one product to another (Frankenthal 1959).

The initial area of blackening of the cans in control Lot No. 1 was apparent, in some cases, the day after they were processed. These control cans were heavily discolored within a period of 360 simulated days as were those experimental, Lot No. 3, cans in which the pH exceeded 6.6. Thus it can be seen that the addition of the proper concentration of lemon juice or citric acid will prevent severe discoloration of the cans.

In comparison of Lot No. 2 and Lot No. 3, it can be seen that at the end of 360 simulated days, 51 percent of the cans of Lot No. 2 containing the 1:40 lemon juice were entirely free of discoloration, whereas only 17 percent of the cans containing the 0.65-percent citric acid were free of blackening. This appears to indicate that an added controlling effect was obtained by using lemon juice. It must be noted, however, that in none of the cans in either Lot No. 2 or Lot No. 3, except in the three cans in Lot No. 3 with a pH exceeding 6.6, was the blackening excessive.

It was apparent from the range of pH values in the cans with a 0, 0+, or 1 rating, whether containing lemon juice or citric acid, that there was a considerable overlap in the values. Therefore, a statistical analyses of variance, called the F test^{1/}, was applied to the pH values regardless of the amount of discoloration and regardless of the additive. The F value did not exceed the 5-percent level of probability, and it was concluded that these groups did not differ significantly in their pH values. Although the pH of the can apparently should be lowered to less than 6.6 for effective control, once it falls below this point the degree of effectiveness of the additive is dependent upon other characteristics of that additive rather than the acidifying characteristic alone.

SUGGESTED PROCESSING METHOD

The processing procedure, employed in these experiments is commonly used in the Gulf of Mexico area to process other types of shrimp. The texture of the canned seabobs was firm, and no evidence of crumbling was observed in either Lot No. 2 or Lot No. 3. There was no evidence of spoilage, other than the iron sulfide discoloration present in some of the cans. This indicated that the processing time, temperature, and pressure were adequate. There appeared to be too much salt present, however, for maximum taste appeal. The cans in Lot No. 3 also appeared to have a slight aftertaste, which could have been due to the citric acid. For these reasons it was decided to pack a small number of cans with varying salt and citric acid concentrations and subject them to organoleptic analysis by a trained panel.

PROCEDURE: Cans were packed with salt concentrations varying from 0.0 to 4.9 g. per can and citric acid varying from 0.0 to 0.65 g. per can. The pack was processed as before, stored until the following day, and subjected to organoleptic evaluation.

RESULTS: Upon evaluation it was found that the optimum pack contained 3.6 g. of salt. At a concentration of citric acid greater than 0.52 grams per can an aftertaste not present in the cans containing 0.52 grams or less, was discerned by some members of the panel. This indicated that it was not practical to increase the amount of citric acid used in the previous experiment in order to attempt to attain the level of protection afforded by the lemon juice. A 1:40 concentration of lemon juice concentrate No. 309, as used in the previous experiment, did not appreciably affect the taste of the shrimp.

SUMMARY

1. A trial pack of shrimp (*Xiphopenus* sp.) was processed to determine the optimum level of lemon juice concentrate No. 309 or citric acid needed to prevent iron sulfide discoloration of the canned product.

^{1/} A statistical test used to determine if differences between measurements may be considered as real.

2. Three large lots were processed: (a) a control lot using no additives; (b) a lot containing 80 to 85 ml. of 1:40 lemon juice concentrate No. 309 in brine per can; and (c) a lot containing 80 to 85 ml. of a 0.65-percent citric acid in brine per can (0.52 g. of citric acid per can). These were stored at 47.5° C. (117.5° F.) for 90 days (360 simulated days). At the end of this period the cans were cut, the discoloration evaluated, and the pH of the contents measured. The following conclusions were obtained from these data:

When the pH was adjusted to a value below 6.6, only slight discoloration of the cans occurred after a storage of 360 simulated days.

Fifty-one percent of the cans in the lot containing lemon juice were entirely free of blackening, whereas only 17 percent of the cans in the lot containing citric acid were free of discoloration. This disparity in percentage of cans free of discoloration would seem to indicate that some factor in addition to acidification of the can contents was active in reducing the iron sulfide discoloration.

In an evaluation of the pH of cans scoring 0, 0+, and 1, regardless of additive or score, no significant difference was found between the lemon-juice lot and the citric-acid lot, further indicating an additive effect obtained in using lemon juice. The only significant difference in pH values obtained was between the pH values of the cans graded 0, 0+, and 1 and those graded 3 (heavily discolored).

3. A third pack was processed to determine the optimum concentration of the ingredients. The trained organoleptic panel preferred the shrimp processed with 3.6-percent brine. It was felt that the organoleptically maximal concentration of citric acid was 0.52 g. per can. A concentration of 1:40 lemon juice concentrate No. 309 did not appreciably affect the taste of the shrimp.

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AUTOMATIC DEVICE PROTECTS DRIFT NETS FROM STORM DAMAGE

The Leningrad Designing Institute of the Fishing Fleet of the U. S. S. R. is stated to have devised an automatic installation for the protection of drift nets from breaking under the strain of a storm. When the length of the nets is more than 2 miles, the strains are enormous and the new device consists of a winding drum and an electric motor which so responds to tension that it automatically pays out more cable as the strain increases and takes in slack when the tension is lowered. (Australian Fisheries Newsletter, July 1958.)

CONSTRUCTION AND OPERATION OF AN INEXPENSIVE FISH SMOKEHOUSE

By Melvin E. Waters* and D. J. Bond**

ABSTRACT

An inexpensive fish smokehouse capable of producing 150 pounds (approximately 240 mullet) each cook has been constructed and operated, utilizing laboratory personnel. This smokehouse, consisting of a steel drum firebox and a 4-foot x 4-foot x 4-foot plywood smoker was built with 16 hours of unskilled labor using common hand tools. The materials purchased at retail on the local market cost \$45. The design permits fairly accurate control of smoke temperature.

INTRODUCTION

Traditionally, the mullet industry of the Gulf and South Atlantic states has depended on the sale of fresh fish (Brawner and A'brams 1956). In recent years, however, owing to consumer resistance to the sale of whole fresh fish, the mullet market has undergone a loss of volume in competition with other fishery products merchandised in a more convenient form.

Smoked mullet is considered a delicacy, but is not widely available. Promotion of this product could lead to utilization of a large volume.

Various kinds of apparatus are used to produce a smoked product from mullet. The product often varies in salt content, moisture, texture, and degree of smoke flavor. A project was undertaken at the Pascagoula Technological Laboratory, therefore, to build a fish smokehouse that could (1) be easily constructed by unskilled labor at minimum cost and (2) produce a uniform product having good taste acceptance.

CONSTRUCTION

The smokehouse consists of two major parts: (1) a firebox and (2) a 4-foot x 4-foot x 4-foot plywood smoker. The separate units are necessary to prevent fire hazards and permit control of smoke temperatures.

Materials	Costs Dollars
3 sheets of $\frac{3}{4}$ " AC exterior plywood	17.40
38 pcs. of 2" x 2" x 4' #2 lumber	2.28
1 lb. of 3 penny galv. nails	0.28
1 lb. of 8 penny finishing nails	0.25
2 pr. brass butt hinges	0.49
2 hooks and eyes	0.12
2 qts. of wood sealer	4.00
1 90° -6" galv. stovepipe ell	0.94
8' of 6" galv. stovepipe	4.00
4 cement blocks	1.28
1 55-gallon oil drum	6.00
16 sq. ft. of $\frac{1}{2}$ in. mesh hardware cloth	2.40
20 doz. eye hooks, small plated	4.56
1 door handle	0.55
20 doz. hooks (made from stainless steel wire)	0.30
Total	44.85

The firebox is constructed from a 55-gallon drum having a removable clamp-on lid (see fig. 1). A 8-inch x 10-inch door is cut near the bottom rim of the drum, using a cold chisel and hand hacksaw. The cutout piece is refitted as a door by attaching it with a pair of brass butt hinges.

On the opposite side of the drum and near the top, a hole 6 inches in diameter is made to fit in a piece of stovepipe. Furnace cement should be used to seal the cracks between the pipe and drum. Eight feet of six-inch galvanized stovepipe is attached at the top rear of the firebox and at the bottom center of the smoker. The simplest procedure is to set up

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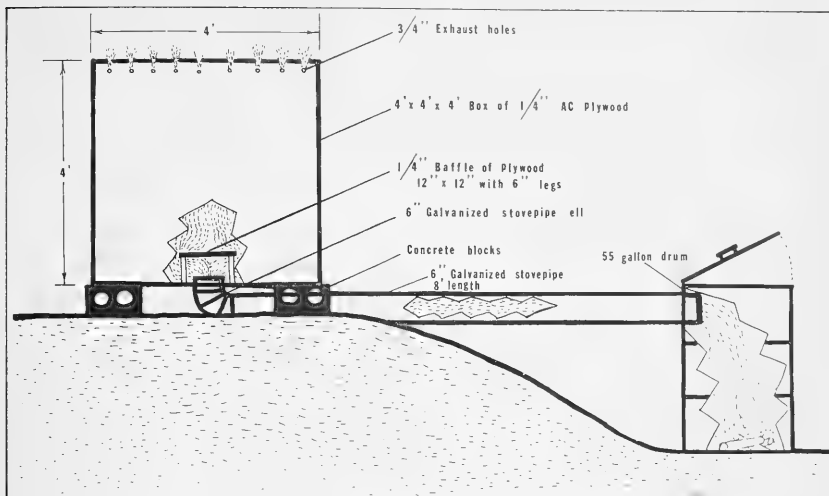


Fig. 1 - Side view of smokehouse and firebox.

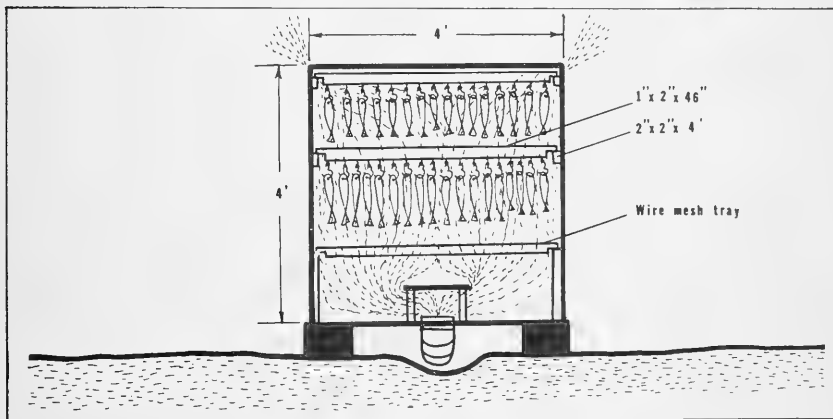


Fig. 2 - Open front view of smokehouse.

the smokehouse on a bank or steep slope with the firebox on the lower grade. Otherwise the smoker must be raised on blocks, or a blower used to gain circulation of the smoke.

The construction of the smokehouse involves the building of four sections: (I) outside section, (II) runners and racks, (III) baffle, and (IV) wire-mesh tray. Materials and costs are shown in table 1. Illustrations and dimensions are shown in figures 1 and 2. Directions for construction are as follows:

I. Outside section

A. Construction of panels

1. Sides--To two pieces of $\frac{1}{4}$ -inch plywood 4-feet x 4-feet, nail 2-inch x 2-inch x 4-foot stock around the outside edges of each piece to construct the two sides.
2. Back--Attach one piece of 4-foot x 4-foot plywood to the 2 sides to form the back of the smoker. Secure firmly.
3. Top--Nail a fourth piece of 4-foot x 4-foot plywood to the two sides and back to form the top.
4. Bottom--Nail a fifth piece of 4-foot x 4-foot plywood in place for the bottom.
5. Door--Make a door from a sixth piece of 4-foot x 4-foot plywood, using 2-inch x 2-inch x 4-foot pieces for bracing. Swing the door on 3 hinges and lock it with 2 hooks and eyes.

B. Exhaust holes--Make several $\frac{3}{4}$ -inch holes in the sides, back, and front near the top in order to allow the smoke to circulate.

C. Wood sealer--Apply two coats of wood sealer to the outside only to prevent warping of the plywood. Do not use sealers and paint inside the box.

II. Runners and racks

A. Runners

1. Using two 2-inch x 2-inch x 4-foot pieces, nail one piece to the inside of each of the sides 4 inches below the top. These will be used to support the first row of racks containing the fish.
2. Drop 12 inches below the first runners and nail in a second pair of runners. This will be used for the second row of racks.

B. Racks

1. For the racks, split 8 2-inch x 2-inch x 4-foot pieces to make 16 1-inch x 2-inch x 4-foot pieces. Cut a notch on each end of the racks, 2 inches long and 1-inch high, to fit on the runners inside the smokehouse.
2. Screw small eye hooks into the lower edge of the racks 3 inches apart, using 15 hooks per rack. Make 2-inch "S" hooks from stainless steel wire for attaching the fish.
3. Place the racks on the runners 5 inches apart.

III. The baffle

- A. Cut a hole 6 inches in diameter in the bottom of the smoke

box. Insert the stovepipe ell from the firebox in such a manner that the end protrudes 2 inches inside the smokehouse.

- B. Cut a piece of $\frac{1}{4}$ -inch plywood 12-inches x 12 inches.
- C. Cut 4 2-inch x 2-inch x 6-inch pieces.
- D. At each corner of the plywood, nail a 2-inch x 2-inch x 6-inch piece to form a stand 6 inches high.
- E. Place the baffle over the stovepipe entry in order to disperse the smoke over the entire smokehouse. (See fig. 2.)

IV. Wire-mesh tray

A. Supports

- 1. Nail a 2-inch x 2-inch x 8-inch piece vertically in each of the bottom corners of the smokehouse to support the tray.

B. Tray

- 1. Nail 4 2-inch x 2-inch x 46-inch pieces to form a square tray.
- 2. Nail a 4-foot x 4-foot piece of $\frac{1}{2}$ -inch mesh hardware cloth to the tray.
- 3. Place the finished tray in place in order to catch any fish that drop during the smoking operations.

This smoker was designed to smoke fish inexpensively and properly, yet to be durable enough to withstand months of use. Sixteen hours were necessary to build the smoker utilizing Scientific Aides from the laboratory. The same construction principles involved can be modified to construct a fish smokehouse of larger size, but prior experience should be gained by the use of this small one.

The distance of separation of the firebox from the smoker may be varied to secure best results in controlling the temperature of the smoke. This structure may be modified to control humidity, if desired. The removable racks make possible hanging and handling of the fish inside a screened building, as the rack full of fish is easily carried by hand.

Hinging one entire side as a door to the smokehouse permits easy hanging and changing of the filled racks.

In this area, storage in a refrigerator of smoked fish of high moisture content quite often results in surface mold on the fish after three to four weeks. The design of this smoker with detachable racks lessens handling and thus lowers mold-spore contamination.

The baffle placed over the end of the stovepipe helps to disperse the smoke more evenly. Smoke from the incoming pipe would otherwise move through a small area of fish and not touch the remaining portion. The $\frac{3}{4}$ -inch exhaust holes around the upper edges of the smoker serve the same purpose in that they create a flow of smoke from all sides of the box and cause a draft from the firebox.

Fish are not only smoked as a means of preserving the meat, but also because of the pleasant taste contributed by the smoke. Therefore, smoked fish is subject to spoilage even under the most sanitary handling conditions. Molds and yeast are responsible for the spoilage in smoked fish and refrigeration must be used to extend the storage life.

THE SMOKING OPERATION

A total of 240 mullet of average size (weighing a total of 150 pounds) are scaled and cut into butterfly fillets with heads left intact. Brining is done in 10-percent salt (37.7 salometer reading) at room temperature for one hour. The mullet are drained long enough to be dry to the touch which produces a glossy pellicle that acts as a protective coating. After being drained, the mullet are hooked through the eye by the stainless steel "S" hooks and attached to the racks.

Fire is started in the firebox about one hour prior to hanging the fish. Charcoal briquets are used to start the fire and green or wet hardwood is added to provide the smoke. In the Pascagoula area, pecan wood, various oaks, hickory, and cherry are suitable.

With some species of fish, a low-temperature smoke is of utmost importance in producing a product with a moist texture and a good smoky flavor. High temperatures result in drying, toughness, and extreme loss of weight. On the other hand, fish such as mullet is best smoked at temperatures from 130° to 180° F. Twelve hours is required to properly smoke small mullet to a golden brown color.

Mullet prepared as indicated here were served to a taste panel of local citizens. The principal criticism was that the fish were of small size and had excessive bones. They nevertheless were well accepted.

SUMMARY

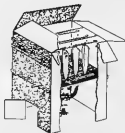
A fish smokehouse was constructed from \$45 worth of materials in 16 hours, utilizing unskilled labor.

Approximately 150 pounds (240 mullet) were smoked in one operation in this smokehouse, producing a product acceptable to a taste panel of local citizens.

The plans may be expanded to construct a larger smokehouse, but it is desirable first to gain experience with a smaller smokehouse such as this one.

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BACTERIOLOGICAL QUALITY OF FISH AND RELATION TO PROCESSING VARIABLES

The bacteriological quality of the fish and its relation to processing variables is being studied by the Seattle Technological Laboratory of the U. S. Bureau of Commercial Fisheries. The intent is to determine the range of the bacterial counts and general bacterial loads of the fish, the equipment, and the finished product; and to determine the relationship between the individual factors and fish quality.

Techniques have been developed for determining the bacterial counts, and sampling is now in progress in the fish-filleting plants in Seattle. Bacteriological samples are taken from the raw material (Pacific cod) and from the various pieces of the processing equipment, as the fish progresses from the fishing boat through the filleting operation (icing, washing, conveying and filleting of the fish; and candling, packaging, and freezing of the fillets).



REFRIGERATED SEA-WATER TANK DESIGNED FOR USE IN STUDIES ON HOLDING WHITING

A large refrigerated sea-water tank has been designed for use in studies on holding whiting at the Bureau's Technological Laboratory, Gloucester, Mass. The new tank will hold over 3,200 pounds of fish at a temperature of 30° F. It features a unique salt-water circulation system and close temperature control using mechanical refrigeration. The equipment will be used on semi-commercial scale tests to obtain more information of the value of this method for holding fish in the New England area.



DEEPEST OCEAN DIVE

The U. S. Navy in January 1960 with its bathyscaphe, named the Trieste, has set a new world's record by diving to the bottom of the Marianas Trench, in the Pacific.

The new record, 37,800 feet, is remarkable because it revealed that the "world's deepest hole" (Marianas Trench) goes down considerably farther than estimated. Previous studies, based on soundings made by a Russian oceanographic ship in 1957, indicated that the depth of the Marianas Trench was only about 35,000 feet.



TRENDS AND DEVELOPMENTS

American Samoa

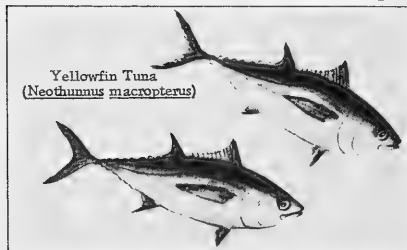
MORE KOREAN TUNA FISHING VESSELS TO FISH FOR CANNERY:

As a result of difficulties with Japanese crews while ashore in American Samoa, 10 additional Korean tuna fishing vessels are expected to fish for the American Samoa tuna cannery in 1960. One Korean tuna vessel began fishing for the cannery in June 1959 (reports from other sources state that first Korean vessel arrived early in 1958) and two more Korean vessels arrived later in the year. In contrast to the Japanese crews, the Koreans have a good reputation.

The American Samoan Government has decided to place two Samoan fishermen aboard each of the Korean vessels for training. (The Suisan Keizai, June 3, 1960.)

TUNA LANDINGS, MAY 1960:

In May 1960, tuna landings by Japanese and South Korean vessels fishing



for the tuna cannery in American Samoa totaled about 1.5 million pounds, or about 19.2 percent below the 1.8 million pounds landed in May 1959. However, the landings for January-May 1960 of 10.6 million pounds were 5.2 percent higher than

the 10.1 million pounds landed during the first five months of 1959.

American Samoa Tuna Landings, May 1960				
Species	May		Jan.-May	
	1960	1959	1960	1959
Albacore	1,295	1,268	8,997	7,545
Yellowfin	109	420	1,232	2,055
Big-eyed	54	130	369	485
Skipjack	1/	-	10	1/
Total	1,458	1,818	10,608	10,085

1/ Less than 500 pounds.
Note: Most of the tuna was landed by Japanese long-line vessels; a small amount was landed by a South Korean long-line vessel.



California

PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 60-7-Pelagic Fish: The inshore area from Punta Banda, Baja California, Mexico, to Fort Bragg, Calif., was surveyed from the air (April 11-15, 1960), by the California Department of Fish and Game Cessna "180" 3632C to determine the distribution and abundance of pelagic fish schools.

Although complete coverage was possible, strong winds hampered observations off central and northern California. No fish schools were seen north of Point Conception and only 131 were found in southern California and Mexico; 17 of the 131 schools were not identified.

Although 34 anchovy schools were observed there were no large concentrations; 17 of the 34 were scattered between Ensenada and the border, 5 were near Huntington Beach, 10 near Rocky Point in Santa Monica Bay, and 2 between Santa Barbara and Point Conception.

Sixty-one sardine schools were observed 1 mile off Laguna Beach and 19 Pacific mackerel schools were counted between Torrey Pines and La Jolla.

A large mass of extremely rich water was encountered between Halfmoon Bay and Davenport. It ranged in color from dirty brown to a soupy-appearing deep red, and the inner margin was 2 to 3 miles offshore. Its westerly extension was not determined. Low passes over the denser portions disclosed, in addition to the predominant dark red

and presumably microscopic organisms, many large jellyfish and small "swarms" of what were

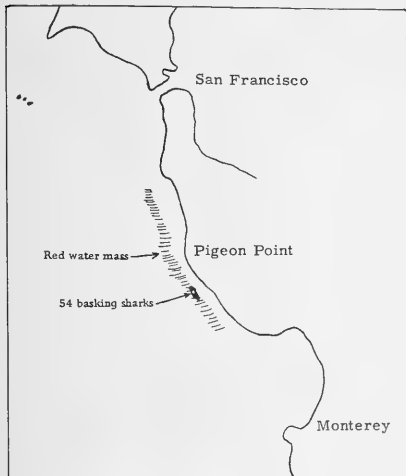


Fig. 1 - Airplane Spotting Flight 60-7 (April 11-15, 1960).

probably euphausiids. The line of demarcation between this water mass and the green to blue-green inshore water was very abrupt and many basking sharks were actively feeding along the "front." A total of 54 basking sharks was seen between Pigeon Point and Ano Nuevo Point.

Since the observers were able to cover only a small part of the water mass it can be assumed

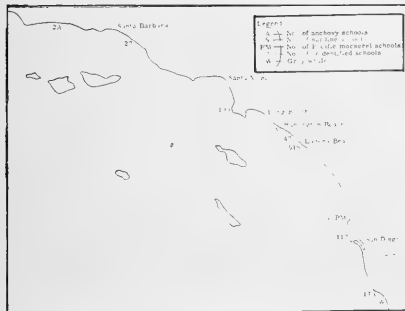


Fig. 2 - Airplane Spotting Flight 60-7 (April 11-15, 1960).

that many more basking sharks (and probably other forms) were feeding in the area.

Unlike surveys of the previous 2 months, only 1 gray whale was seen. It was near Punta Salsipuedes, Baja California. /

Airplane Spotting Flight 60-11-Pelagic Fish: The aerial survey to determine the distribution and abundance of pelagic fish schools was continued (May 16-20, 1960), by the Department's Cessna "180" 3632C along the inshore area from the California-Mexico border north to the Russian River.

Strong winds off central and northern California created unfavorable conditions for aerial observations, but weather and visibility were good south of Point Conception.

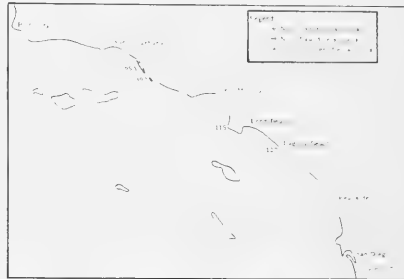


Fig. 1 - Airplane Spotting Flight 60-11 (May 16-20, 1960).

The only concentration of fish schools found during the survey was in the Ventura-Port Huene area. A group of 83 anchovy schools was seen close to shore between Ventura and Rincon Point, 12 more off Port Huene, and 30 deep unidentified schools between Point Mugu and Point Dume.

Only 23 other schools were seen during the flight. Of these, 11 observed were about 1 mile south of Point Vicente. The rest were off Laguna Beach and could not be identified.

Note: Also see *Commercial Fisheries Review*, July 1960 p. 21.

CRAB FISHING AREA AND INTENSITY STUDIES CONTINUED:

Airplane Spotting Flight 60-8-Crab: Commercial dungeness crab fishing areas from Pt. Arena to the California-Oregon border were surveyed from the air on April 18-19, 1960, by the Department's Cessna 182 to determine the fishing localities and the relative density of crab gear of the northern California crab fleet.

Conditions for observing the strings of crab gear were generally good throughout the 2-day survey.

A total of 177 lines of crab gear was counted, 155 (87.5 percent) north of Cape Mendocino and 22 (12.4 percent) south of the Cape but north of Pt. Arena. The 155 strings observed north of Cape Mendocino were 33 less than for the same area in March. Most of the gear was within 2 miles of the beach. Some gear was even in the breaker zone.

When compared with the March survey, several shifts in gear density are noted. This includes

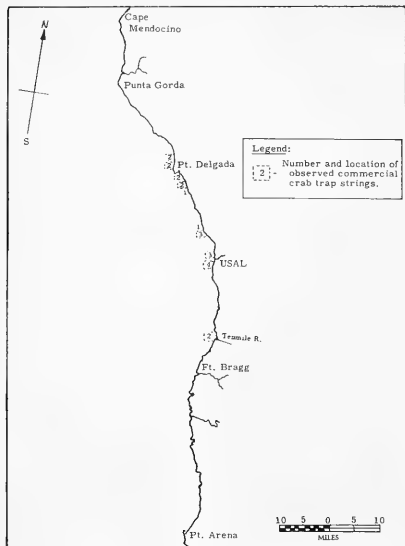


Fig. 1 - Airplane Spotting Flight 60-8-Crab (Apr. 18-19, 1960).

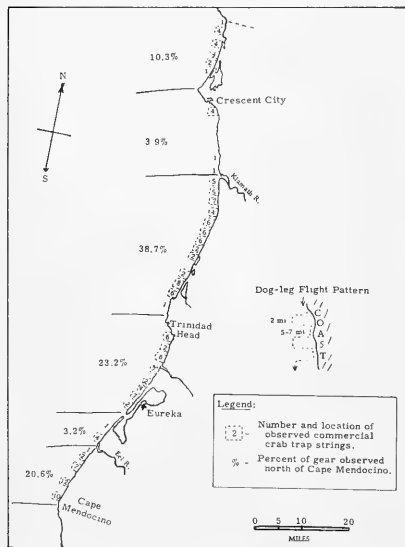


Fig. 2 - Airplane Spotting Flight 60-8-Crab (Apr. 18-19, 1960).

shifts from the area immediately south of Crescent City--down 11 percent--to the area south of the Klamath River--up 14 percent--and an apparent shift from the area south of Humboldt Bay--down 17 percent--to the area between Humboldt Bay and Trinidad Head--up 15 percent.

South of Cape Mendocino crab gear was observed off Point Delgado, Usal, and Tenmile River. No previous observations are available for comparison in these areas.

Airplane Spotting Flight 60-10-Crab: The survey of the commercial crab fishing area from the Oregon border to Punta Gorda was continued on May 16 to locate fishing areas and count the strings of crab traps.

Visibility was good, although a strong wind produced a heavy swell and white caps making observation difficult at times.

A total of 126 strings of traps was located. The greatest concentrations were off Crescent City and

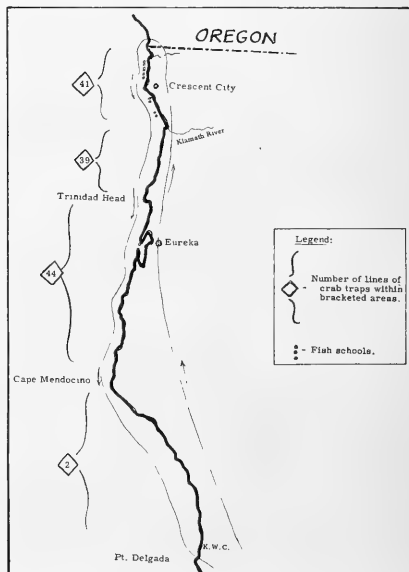


Fig. 1 - Airplane Spotting Flight 60-10-Crab (May 16, 1960).

the Klamath River. The majority of the traps was located close inshore, usually within one-fourth mile of the beach. A few strings were as far off as 2 miles.

Several dense schools of fish, on which birds and seals were feeding, were observed. It was not possible to determine the species but they had the appearance of anchovy schools.

Note: Also see *Commercial Fisheries Review*, June 1960 pp. 19-21.

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AERIAL CENSUS OF COMMERCIAL AND SPORT FISHING FOR ABALONE CONTINUED:

Airplane Spotting Flight 60-9-Abalone: The shoreline from Princeton to Fort Bragg was surveyed (May 14, 1960) from the air by the California Department of Fish and Game Cessna 182 to locate areas of abalone sport fishing and to estimate the numbers of abalone fishermen, clam diggers, and skin divers.

Visibility was excellent although fog was encountered from Princeton to San Francisco. Due to strong winds, heavy swells and waves were prevalent along the entire coastline. In some areas skindivers, working offshore in rough water, were attached to a line held by friends on the shore. Not only were great numbers of people in the more commonly-known abalone areas but along the entire shoreline sportsmen, skindivers, and fishermen were seen in areas where they seldom, if ever, were previously observed. Many school classes were seen, as well as fishermen.

Although 3,720 people were counted on the shore and in the water, it is believed that this was a minimum count and that at least 20 percent additional were missed.

The northern end of Tomales Bay was again occupied by hundreds of clam diggers. Barges, skiffs, and other craft were observed ferrying sportsmen out to the mud flats.

The greatest numbers of abalone fishermen (690) were seen at Fort Ross, with the next greatest numbers (320) at Montara Beach in San Mateo County.

Note: Also see *Commercial Fisheries Review*, June 1960 p. 19.

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SHRIMP STUDY OFF CALIFORNIA COAST CONTINUED:

M/V "N. B. Scofield" Cruise 60-S-2-Shrimp: Coastal waters off southern central and northern California were surveyed by the California Department of Fish and Game research vessel N. B. Scofield from April 5-May 3, 1960, to locate areas of concentrations of pink shrimp (*Pandalus jordanii*). Other objectives were: (1) to determine size, sex, and weight of shrimp from different beds; (2) to make bathythermograph casts to obtain bottom temperatures in shrimp fishing areas; (3) to make plankton tows in an effort to obtain shrimp larvae from various depths; (4) to determine size and weight of incidental fish catches; and (5) to collect specimens requested by other investigations.

EXPLORATORY OPERATIONS: Strong north-west winds and high swells hampered operations throughout most of the cruise. A total of 69 tows was made with a 20-foot beam trawl having a net of 1½-inch mesh.

Off Santa Monica, pink shrimp were found in 100 and 110 fathoms of water. The best of 3 tows in that locality produced 2 pounds in a half hour.

Off Gaviota, pink shrimp were caught in 2 of 3 tows. The most productive, in 110 fathoms, produced 8 pounds of shrimp in a half hour.

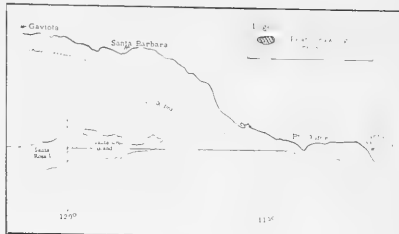


Fig. 1 - M/V N. B. Scofield Cruise 60-S-2-Shrimp (April 5-May 3, 1960).

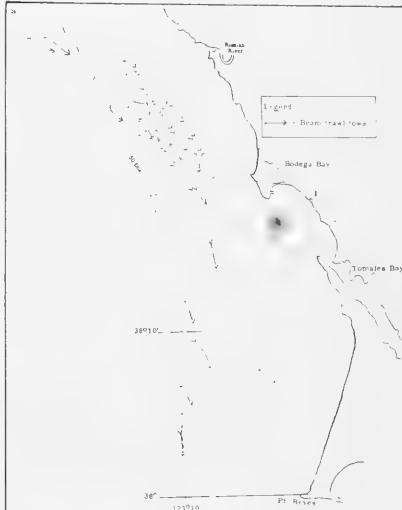


Fig. 2 - M/V N. B. Scofield Cruise 60-S-2-Shrimp (April 5-May 3, 1960).

A total of 23 tows was made in the Avila area. Shrimp could not be found in commercial concentrations, even though catches were made in 21 of the 23 tows. The best tows produced 82 pounds in 45 minutes at 105 fathoms off Pt. San Luis and 52 pounds in 30 minutes off Pt. Sal in 120 fathoms. An area approximately 20 miles in length was covered and trawling was conducted in depths of 80 to 130 fathoms.

In the Bodega area, shrimp were caught in 26 of 39 tows. A concentration of shrimp was found in commercial quantities off the Russian River in 40-47 fathoms. The area was approximately 7 miles long and 2 miles wide. Within this area 22 tows produced catches averaging 746 pounds per hour. Calculations based upon catch-per-hour, trawling area covered, and total area, gave an estimate of 880,000 pounds of shrimp inhabiting this area. Six tows from Salt Point to Ft. Ross in 58 to 52 fathoms of water yielded few shrimp.

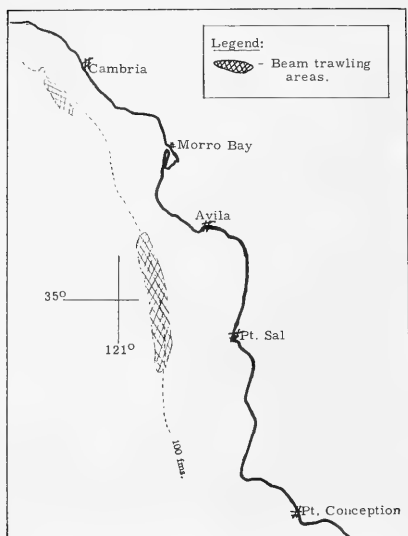


Fig. 3 - M/V N. B. Scofield Cruise 60-S-2-Shrimp (April 5-May 3, 1960).

SIZE, SEX, WEIGHT, AND COUNT OF SHRIMP: Samples of shrimp were obtained from 3 tows off Santa Monica, 2 off Gaviota, 18 off Avila, and 23 off the mouth of the Russian River. Approximately 100 shrimp from each of these samples were sexed and measured. Heads-on count and weight determinations were made at sea except at Bodega Bay where samples from the commercial fleet were counted and weighed shoreside.

TEMPERATURES: Fifty-six bathythermograph casts were made in depths ranging from 38 to 130 fathoms. Casts were made in all areas where shrimp were caught and also in areas where shrimp were not taken.

Reversing thermometer casts were made in the center of the shrimp concentration off the Russian River. The temperatures were 7.9°C . (46.2°F .) on April 29 in 44 fathoms and 8.5°C . (47.3°F .) on May 1 in 40-44 fathoms. Vessel thermograph and surface temperatures were recorded during all tows for the entire cruise. These ranged from 8.4°C . (47.1°F .) off the mouth of the Russian River on April 24 to 15.2°C . (59.4°F .) off Santa Monica on April 5.

PLANKTON TOWS: A one-half-meter plankton net was secured to the beam trawl framework. Fifty plankton samples were thus obtained in conjunction with beam trawl tows. These samples are to be examined for shrimp larvae.

INCIDENTAL FISH: The catch of incidental fish was small because a small unweighted foot

rope was tied onto the beam from 6 to 12 inches above the runners. Counts and average weight of all species taken in 47 tows were recorded. In addition, all fish taken in 8 of the tows were measured.



Hake
(*Merluccius productus*)

Hake (*Merluccius productus*), slender sole (*Lyopsetta exilis*), stripetail rockfish (*Sebastes saxicola*), and splitnose rockfish (*Sebastes diploproa*) were the major incidental fish in the catches in the Santa Monica, Gaviota, and Avila areas. Hake, rex sole (*Glyptocephalus zachirus*), and Pacific sanddabs (*Citharichthys sordidus*) were the principal fish species in the Bodega area catches.

Note: Also see *Commercial Fisheries Review*, December 1959 p. 42.

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OPERATIONS IN 1960 OF WHALING LAND STATIONS:

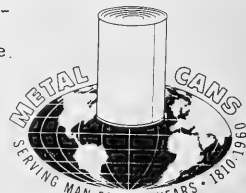
As of June 1, licenses for 1960 baleen whaling were issued for two primary and two secondary land stations for processing whales and for 5 whale catcher vessels. These whaling operations, which are located in the San Francisco Bay area, are the only licensed operations in the United States, and are at the same level as in 1959. In 1959, 309 whales were taken for oil, animal food, and other byproducts.



Cans--Shipments for Fishery Products, January-April 1960

Total shipments of metal cans during January-April 1960 amounted to 32,874 short tons of steel

(based on the amount of steel consumed in the manufacture of cans) as compared with 29,974 tons in the same period a year ago. Canning of fishery prod-



ucts in January-April this year was confined largely to tuna, Gulf oysters, and Pacific jack mackerel.

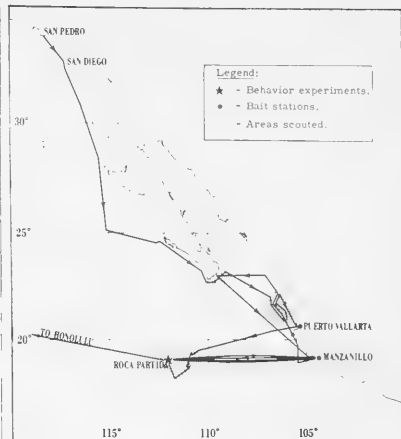
Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Central Pacific Fishery Investigations

SKIPJACK TUNA BEHAVIOR STUDIES IN EASTERN PACIFIC:

M/V "Charles H. Gilbert" Cruise 47: The research vessel Charles H. Gilbert of the U. S. Bureau of Commercial Fisheries Biological Laboratory at Honolulu, returned to her home port after an absence of 27½ weeks. Departing from Honolulu on November 12, 1959, the Charles H. Gilbert proceeded to a shipyard in Oregon where a new bulbous bow with underwater observations ports was installed and extensive alterations were made to the berthing, bridge, and laboratory facilities. After a shakedown cruise from Portland, Oreg., to San Pedro, Calif., the vessel carried out (April 1-May 23, 1960) an oceanographic, biological, and fishery survey in Eastern Pacific waters off the west coast of Baja California, Cape San Lucas, and the Las Tres Marias and Revilla Gigedo Islands. Experiments designed to study the behavior of skipjack and yellowfin tuna and bait fishes were carried out. These experiments included underwater observations, primarily from the stern chamber in the Charles H. Gilbert, of the behavior pattern of fish in response to water sprays, to different species of bait, to "tinsel glitter" (a potential bait en-



M/V Charles H. Gilbert Cruise 47 (April 1-May 23, 1960).

hancer), to live and dead bait, and to rates of chumming. Preliminary analyses of the resulting data indicate that the tuna did not exhibit any difference in behavior whether sprays were on or off. They did exhibit different responses to different baits, with the most pronounced excitation resulting from the most elusive bait, thread herring. As to the behavior of the bait, the northern anchovy sounded immediately and, upon sighting the tuna, reversed direction and headed to the surface. Two other species of anchovy (both unidentified) assembled into schools and moved away from the vessel. The thread herring sounded, but unlike the northern anchovy, they exhibited considerable evasive action



The Service's research vessel Charles H. Gilbert.

as they sounded, luring the tuna away from the surface and the vessel. The tuna showed no response to the glitter. Although their movements slowed considerably when chummed with dead bait, they were observed to feed on the dead bait. The only obvious change in tuna feeding behavior with changes in rate of chumming was a decrease in activity with slower chumming rates.

Other objectives of the cruise were as follows:

- (1) Determine the temperature structure of the water over sea mounts and banks. Bathythermograph sections over two banks in the Revilla Gigedos were obtained before equipment failure forced a discontinuance.
- (2) Locate the California Current Extension or parts thereof between the west coast and Hawaii by surface salinity and temperature measurements and BT's. Bathythermographs and water samples for phosphate, nitrate, and salinity determinations were taken at 0000, 0600, 1200, and 1800 hours GMT from Revilla Gigedos to Hawaii.
- (3) Tag and release skipjack. Forty-six skipjack were tagged off the Island of Roca Partida. One tagged skipjack was recovered seven days after being tagged.
- (4) Transport collection of live fish and personnel of Hawaii State Division of Fish and Game from Mexico to Hawaii. A total of 3,800 snappers, *Lutianus* sp., were transported from Manzanillo with 89 percent survival.

Fishing was poor. Only six schools of tuna were sighted beyond the immediate vicinity of Roca Partida. None of these responded to live-bait chumming. Fishing incidental to the behavior experiments produced 545 skipjack, 678 yellowfin, and 30 little tuna.

Note: Also see *Commercial Fisheries Review*, January 1960 p. 30, and June p. 25.



Dams

FISH AND WILDLIFE BUREAUS RELEASE REPORT ON PROPOSED BRUCES EDDY DAM AND RESERVOIR IN IDAHO:

A report evaluating the probable effects of construction of the proposed Bruce Eddy Dam and Reservoir project in Idaho on fish and wildlife resources and recommending conservation measures in event the dam is authorized by Congress was released on July 7, 1960, by the Fish and Wildlife Service of the Department of the Interior.

The report, issued after a four-year study, was signed by D. L. McKernan,

Director of the Bureau of Commercial Fisheries, and by A. V. Tunison, Acting Director of the Bureau of Sport Fisheries and Wildlife. The document was addressed to Arnie J. Suomela, Commissioner of Fish and Wildlife of the Department of the Interior. The study was made with the cooperation of the Idaho Department of Fish and Game.

The effect of the project on big-game herds in the North Fork drainage would be highly adverse, according to the report. The Clearwater elk herd is one of the largest in the United States.

The report states the project also would damage both resident and migra-



tory fishes. The most damaging effects would be to the steelhead trout, 60 percent of which spawn above the Bruce Eddy Dam site. If the project were to be constructed there is no assurance that the runs of migratory fish could be maintained at even present low levels.

If the project is authorized, the two Bureaus recommend that conservation and development of fish and wildlife resources should be included as an authorized project purpose and that the following measures be taken:

- (1) Fish passage facilities at Bruce Eddy Dam be undertaken at an estimated cost of \$15 million.
- (2) Facilities for artificial propagation of anadromous fish be included at an estimated cost of \$2 million for construction and \$200,000 a year for operation.
- (3) Facilities be provided for the annual production of 500,000 catchable-size trout for stocking the reservoir and its tributaries at an estimated construction cost of \$600,000 with an annual operating cost of \$90,000.
- (4) A flow of not less than 2,000 second-feet of water in the North Fork of the Clearwater be made below the dam at all times and the temperature of the water is to be maintained between 45 degrees and 65 degrees Fahrenheit.

(5) Stream improvement work above the reservoir at a cost of \$1 million to be carried out with outlet structures in the dam so designed and located that downstream migrating fish will not be drawn into them.

(6) Lands additional to project needs be acquired and made available for management and habitat improvement for big game, especially elk, at an estimated cost of \$1,900,000 for acquisition of the necessary land and initial development.

There were also recommendations which would assure the public the fullest possible use of the area, provide for consultation and cooperation in minimizing the adverse effect of transporting logs downstream, and assure cooperation between the Forest Service, the Fish and Wildlife Service, and the Idaho Department of Fish and Game in the management of the acquired lands.



Federal Aid Funds for Sport Fish and Wildlife Restoration

State fish and wildlife restoration projects received an apportionment of \$12,800,000 in Federal aid, with funds made available July 1, 1960, the Secretary of the Interior Fred A. Seaton announced. The balance of Federal Aid fish and wildlife restoration program funds for the year ending June 30, 1961, will be apportioned at the usual time in the fall.

The early apportionment is designed to help states program their Federal Aid activities more advantageously. It will be of special importance to those states operating on a revolving-fund basis.

Under the Federal Aid fish and wildlife restoration programs, states expend their own funds on approved projects and are then reimbursed up to 75 percent of the cost. On July 1, 1959, 14 states had exhausted their Federal Aid money available for obligation for fish-restoration programs and 16 states were without Federal Aid funds for obligation on wildlife restoration activities. Several other states had less than \$5,000 in Federal Aid funds available for obligation. The partial apportionment will make it possible for states to immediately claim reimbursement after July 1, 1960, for expenditures made in connection with

projects approved for the year ending July 1, 1961.

Federal Aid funds are derived from an excise tax on sporting guns and ammunition and on sporting rods, reels, creels, and artificial lures. Distribution is made on a formula based upon the number of license holders in a state and on its area.

The two Federal Aid Acts are administered by the Bureau of Sport Fisheries and Wildlife, U. S. Fish and Wildlife Service.



Of the partial apportionment of \$12,800,000, a total of \$10,300,000 is for the restoration of wildlife and \$2,500,000 for the restoration of fish. No indication was given relative to the probable total apportionment, but in recent years wildlife restoration funds have been between \$12 and \$13 million exclusive of a \$2,693,000 backlog which no longer exists) and fish restoration funds have been something in excess of \$5 million.



Florida

MIAMI UNIVERSITY RECEIVES GRANTS FOR FISHERY AND OCEANOGRAPHIC STUDIES:

The Physical Science Division of the Marine Laboratory of the University of Miami is in receipt of several grants from the National Science Foundation. The first for \$18,600 was given in order to study the feasibility of the use of the catamaran, or twin-hull, principle for an oceanographic research vessel.

"It has been clear for a long time that the conventional type of boat construction does not correspond to the needs of oceanographic research vessels," says the head of the Physical Science Division. "For oceanographic research the scientists need a platform from which they can work with as little interference as possible from the boat movement and the weather conditions prevailing on the sea. They want to have as many laboratories

as possible and a rather large free deck area. The vessel should have a rather high speed but still be able to reduce its speed below a knot. The deck officer in charge should be able to watch all operations and be able to maneuver the vessel quickly in such a way that sudden changes in speed and position of the vessel can be achieved. The classical concept of ship construction does not take care of these requirements in the most economical way. Ships are getting too large and expensive to build before the requirements are fulfilled."

The catamaran principle would automatically enlarge the deck area by the increase of the beam. Furthermore it gives a center well between the two hulls which can be used for nearly all observations and would allow handling of deep-sea gears in a shielded position. As the beam of each of the two hulls can be kept rather small, an economical high speed is easily achieved. The twin-hull construction provides for a more stable platform. The over-all length could be about 120 to 150 feet as compared with 250 feet for the conventional type vessel. Naval architects have not yet studied the structural design of large catamarans. Consequently, in order to be able to build a larger vessel based on this principle, structural studies and model experiments have to be carried out.

Such a vessel should be designed to carry a 16-man ship's crew, a 15-man scientific crew, should be 120 feet long with a 50-foot beam, have a top speed of 15 knots and the possibility to reduce the speed to one-tenth of a knot, three center wells for easy handling of all gears between the hulls, three articulated booms for handling of all gears on deck and over the side of the ship, and eight laboratories.

Naval architects Friede and Goldman, Inc., have been subcontracted for carrying out the feasibility study. They will work in close cooperation with Marine Laboratory scientists to assure the most functional design of the vessel.

A second grant for \$28,000 is to cover the expenses of the operation of The Marine Laboratory research vessel Gerda.

This grant will be used for geophysical studies, for development of instruments where boat time is required, for studies in Florida Bay, Straits of Florida, and the Bahamas.

A third grant for \$64,000, for a period of two years, is for the establishment of a Carbon-14 laboratory. Facilities are being built for the dating of Late Pleistocene events by the radiocarbon method. The Marine Laboratory intends to apply this method to a program of dating deep-sea as well as near-shore sediments.

The several objectives of this program include the establishment of accurate assays of the geochemical balance in the oceans, and the dating of major climatic, oceanographic, and geological events. In particular, the techniques will be used to assess the various rate changes accompanying the changing physical-chemical conditions of the sedimentary environments.

A grant for \$14,600 is for basic research on coral reef fishes. This work will be carried out on the reefs around St. John Island in the Virgin Islands. It is a continuation of work already started there November 1958.

Photographs and descriptions of each species studied will be prepared, along with data on habitat, food habits, growth, spawning, et cetera.



Fur Seals

PELAGIC SEALING STUDIES OFF ALASKA:

The vessel Windward under charter to the U. S. Bureau of Commercial Fisheries left Seattle, Wash., on April 18 for the Sitka area to continue the International North Pacific Fur Seal Commission's high-seas research program.

Few seals were found in West Crawford Inlet, Silver Bay, or Sitka Sound, and the vessel went on to the Gulf of Alaska. Near Kodiak, fur seals began to appear in appreciable numbers about April 18. The chartered vessel Tacoma observed 796, mostly about 30 miles off Cape Barabaras on Kodiak, and collected 242 from

April 18 to 30. The seal concentration, which was accompanied by a great num-



ber of seabirds (shearwaters), Steller sea lions, and an estimated 30 to 40 humpback whales, was feeding on capelin, sand launces, and some small herring. As previously observed in the Gulf of Alaska, early-arriving seals were predominately adult females. About 430 seals have been collected since the start of pelagic operations. With two vessels, a quota of 1,250 is planned. If as hoped, a substantial part of these can be taken in the Gulf of Alaska by mid-June, the vessel remaining on charter (*Windward*) will be free to carry out more exploratory work in the Bering Sea than has been possible before.



Great Lakes Fisheries

Exploration and Gear Research

SEASONAL DISTRIBUTION OF COMMERCIAL FISH STOCKS IN LAKE ERIE:

M/V "Active" Cruise 9: The first in a series of cruises scheduled for Lake Erie during 1960 was conducted (May 18-28, 1960), by the U. S. Bureau of Commercial Fisheries fishing vessel *Active*. Objectives of the cruise were to obtain additional information on the seasonal distribution of fish stocks and to provide gear demonstrations for commercial fishermen from ports within the area of operation.

Systematic echo-sounding operations were carried out in United States waters between Sandusky and Avon Point, Ohio.

During the 10-day cruise, 15 exploratory trawl drags were completed in the 3- to 10-fathom depth



M/V *Active* Cruise 9 (May 18-28, 1960).

range using a 50-foot two-seam balloon trawl equipped with a $1\frac{1}{2}$ -inch mesh cod end.

Catches of up to 200 pounds of smelt were made per drag over the entire area. The majority of the smelt in this area was 16 to 20 lb the pound. Several drags made north of Lorain, Ohio, produced catches of smelt, 9 to 10 to the pound. Commercial quantities of yellow perch were taken in trawling operations completed off Lorain, Ohio.

Thermal stratification was recorded from near Kelleys Island eastward throughout the cruise area. Surface water temperatures recorded during the cruise ranged from 57°-60° F. Bottom water temperatures ranged from 59° F. at 3 fathoms to 45.7° F. at 10 fathoms.

The *Active* was scheduled to depart Vermilion, Ohio, about June 6 on the second 10-day exploratory fishing and gear research cruise. Area of operations were to be from Avon Point, Ohio, to Erie, Pa.

Note: Also see *Commercial Fisheries Review*, July 1960 p. 28.

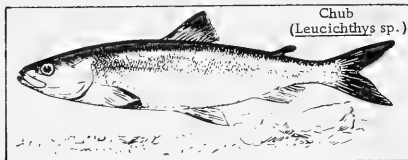


Great Lakes Fishery Investigations

LAKE MICHIGAN FISH POPULATION SURVEY:

M/V "Cisco" Cruise 1: The 1960 program to estimate the status of the chub (*Leucichthys* sp.) population of southern Lake Michigan was initiated April 26-May 10, 1960, by the U. S. Bureau of Commercial Fisheries research vessel *Cisco*. Throughout the season trawls and gill nets of standard design will be fished intensively at selected locations to measure the species composition, distribution and abundance of chubs and associated species.

The *Cisco* began trawling operations with a 52-foot, two-seam balloon trawl, similar to those presently used by commercial trawlers in Lake Michi-



gan. One or more tows were made at each 5-fathom interval from 15 to 40 fathoms off Grand Haven, Mich. Chub catches ranged from 41 to 342 pounds per 30-minute tow. More than 99 percent of the chubs taken in the trawls were bloaters (*Leucichthys hoyi*). The chubs averaged about 9 to the pound; only about 5 percent were over 9 inches long. Also in the catches were small numbers of lake herring, alewives, smelt, trout-perch, slimy sculpins, deep-water sculpins, spottail shiners, and emerald shiners.

Linen gill nets were set for 4 nights at 25 and 50 fathoms off Grand Haven. These nets, made up of equal amounts of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, $2\frac{1}{4}$ -, and 3-inch mesh, extension measure, are the identical ones which were set in southern Lake Michigan in 1954. The catch in the 25-fathom set was light (129 chubs, 3 lake herring, 2 alewives, 2 smelt in 1,275 feet of net), but the net was so badly fouled with weeds that it undoubtedly did not fish effectively. Bloaters made up 93 percent of the identified chubs; the remainder were *L. alpenae*, except for 1 *L. zenithicus* and 1 *L. reighardi*. At 50 fathoms 279 chubs and 5 alewives were taken in 2,550 feet of net. Here bloaters constituted 94 percent of the chub catch, *L. reighardi* 4 percent, and *L. alpenae* and *L. kiyi* 1 percent each. Some of the *L. reighardi* were freshly spent.

Nylon gill nets (50 feet each $1\frac{1}{4}$ - and $1\frac{1}{2}$ -, and 300 feet each 2-, $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh), set for one night at 50 fathoms in the same area as the linen nets, caught 142 chubs, 60 of them in the $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch meshes. All chubs were bloaters except for 2 *L. kiyi* and 1 *L. reighardi*.

In order to study the differences in catches of gill nets set for various lengths of time, several identical gangs of nylon nets (same mesh composition as the gang at 50 fathoms) were set at 25 fathoms off Grand Haven. Three sets were for 1 night, 2 for 2 nights, 1 for 3 nights, and 1 for 5 nights. No thorough analysis of the differences in catches has been made, but an obvious conclusion that may be drawn is that chub catches may vary widely from night to night. On successive nights the one-night sets took 361, 637, and 384 chubs, respectively. The 2-night sets made numerically similar catches of 801 and 843 chubs, respectively, but the size composition of the fish was appreciably different in the 2 sets.

A hydrographic station was established at 25 fathoms off Grand Haven. Collections, which will be standard for all stations during 1960, included bottom fauna, net plankton, nannoplankton, and water for chemical analysis. Water temperatures in southern Lake Michigan were very cold, mostly 2-3° C. (35.6°-37.4° F.) except near shore. Extremes were 1.8° C. (35.3° F.) and 15.7° C. (60.3° F.). The latter was recorded at the mouth of the Grand River. A peculiar temperature inver-

sion was observed 5 miles offshore (25 fathoms) from Grand Haven. The water was vertically homo-thermous at 2.4° C. (36.3° F.) except for a shallow layer at 4.6° C. (40.3° F.) near the bottom.

Considerable lost time due to bad weather and engine trouble resulted in cancellation of scheduled trawling, gill-netting, and hydrographic work in the area off St. Joseph, Mich.

M/V "Cisico" Cruise 2, May 17-31, 1960: A loss of several days due to major engine repairs to the *Cisico* resulted in the cancellation of some of the work planned for cruise 2.

Trawl catches at 15, 20, 25, 27, 30, 35, and 40 fathoms off Grand Haven, Mich., ranged from 80 to 523 pounds per 30-minute tow. Average chub catches per tow were 163 pounds at 15 fathoms, 360 at 20 fathoms, 173 at 25 fathoms, 442 at 27 fathoms (one tow), 116 at 30 fathoms, 80 at 35 fathoms, and 88 at 40 fathoms. Practically all the chubs were bloaters (*Leucichthys hoyi*). Less than 5 percent were large enough for smoking. The proportion of larger chubs was somewhat greater at shallower depths. A fairly large number (42 pounds per tow) of deep-water sculpins was taken at 40 fathoms. At other depths the trawls caught only a few deep-water sculpins, slimy sculpins, alewives, smelt, lake herring, and yellow perch.

Catches at the beginning of the cruise were greater than at the end, when fathometer tracings indicated that there were many fish off the bottom. New, larger trawl doors were put into use at the beginning of the cruise. They appeared to spread the net better, but catches continued to be mostly small. Further trawling will be necessary before it can be determined whether these small catches are the result of the trawl fishing improperly, or whether there has been a scarcity of fish on the bottom.

Linen gill nets set in 25 fathoms (255 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, $2\frac{1}{4}$ -, and 3-inch mesh) and 50 fathoms (510 feet of each of the above mesh sizes) off Grand Haven took more bloaters and less of the other species of chubs than did identical sets on about the same date in 1954). At 25 fathoms the catch this year was 213 *L. hoyi*, and 1 *L. alpenae*; in 1954 it was 78 *L. hoyi*, 3 *L. alpenae*, 8 *L. zenithicus*, and 8 *L. reighardi*. At 50 fathoms the catches were 378 *L. hoyi*, 4 *L. alpenae*, 1 *L. zenithicus*, 18 *L. reighardi* in 1960, and 258 *L. hoyi*, 6 *L. alpenae*, 14 *L. zenithicus*, 24 *L. reighardi*, and 18 *L. kiyi* in 1954.

Regular gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch mesh, 300 feet each of 2-, $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) set overnight at 25 and 50 fathoms off Grand Haven produced many more chubs than the linen nets, but the species composition was similar. The 2-inch mesh proved the best chub mesh. At 25 fathoms it took 216 chubs weighing 46½ pounds as compared with 59 chubs weighing 7 pounds in the $2\frac{1}{2}$ -inch mesh. The $2\frac{3}{8}$ -inch mesh caught 73 chubs weighing 13½ pounds. This same relationship between catches in these mesh sizes was also true at 50 fathoms, but catches were smaller.

Rather light chub catches were made in regular gangs of nylon gill nets set overnight in 25 fathoms

and for 2 nights in 50 fathoms off Racine, Wis. One hundred ninety-five *L. hoyi*, 1 *L. zenithicus*, and 4 *L. reighardi* at 25 fathoms, and 381 *L. hoyi*, 4 *L. alpenae*, and 30 *L. reighardi* at 50 fathoms, constituted the chub catches. A few alewives were taken at both depths.

Appreciable surface warming (surface temperature mostly 7-12° C. or 14.6-53.6° F.) extended out for about 10 miles from both shores in southern Lake Michigan, but was more pronounced on the east side. In the central area the water remained practically isothermally vertically—surface temperature mostly 3.5-5.0° C. or 38.3-41.0° F. The minimum recorded was 3.4° C. (38.1° F.), and the maximum 18.8° C. (68.8° F.) near the mouth of the Grand River, Mich.

Note: Also see Commercial Fisheries Review, July 1960 p. 29.

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WESTERN LAKE SUPERIOR FISHERY SURVEY:

M/V "Siscowet" Cruise 1: The first of three cruises of the U. S. Bureau of Commercial Fisheries research vessel *Siscowet*, scheduled in 1960 to study the bathymetric and areal distribution of fish stocks by systematically fishing standard gangs of experimental gill nets (mesh sizes 1" to 5" by $\frac{1}{2}$ " intervals), was conducted (April 26-May 19, 1960) in western Lake Superior.

Standard gangs were fished at various depths south of Stockton Island and north of Sand Island. At the Stockton Island station the nets were set at 5, 15, 25, 35, and 54 fathoms. At the station north of Sand Island the nets were set at 15, 25, 52, and 82 fathoms. An oblique set from the surface to 50 fathoms was also made at both stations with nets having a mesh of 2 $\frac{1}{4}$ inches.

Trawling operations were conducted at the Stockton Island station, Pike's Bay, north of Sand Island, and north of Houghton Point. A limited amount of inshore work was done along the southwest shore of Cat Island and the north shore of Stockton Island with the skiff powered by an outboard motor. Small trawls and plankton nets were towed in shallow waters immediately adjacent to shore in an effort to capture recently hatched fry.

Catches in the oblique sets were very sparse at both the Stockton Island station and the Sand Island station. Trawl catches were light at all areas trawled. One 15-minute tow in Pike's Bay (20 fathoms) took about 500 smelt, 2-3 inches in length. A 15-minute tow north of Houghton Point (12 fathoms) took 74 yellow perch averaging 3 inches in length. Tows made north of Sand Island (54 fathoms) took small numbers of ninespine sticklebacks, muddlers (3 species), and chubs (*L. hoyi*).

Catches in the inshore areas were also extremely light. Attempts to capture recently-hatched fry in both the trawl and larva net were unsuccessful.

Surface temperatures varied from 34.9° F. north of Sand Island to 38.4° F. south of Stockton Island. In the deeper areas (below 50 fathoms) the bottom temperatures were slightly warmer (about 40° F.).

M/V "Siscowet" Cruise 2: This cruise was a continuation of a long-term observation of environmental conditions and fish populations at three index stations established by the *Siscowet* in 1958. These stations are located southeast of Stockton Island, northeast of Bear Island, and east of Pike's Bay.

At each station standard gill-net gangs (1- to 5-inch mesh by $\frac{1}{2}$ -inch intervals) were fished and limnological data and materials were collected including: records on water temperatures; water samples for chemical analyses; plankton and bottom samples; and Secchi-disc readings. Trawls were fished where possible but concentrations of commercial gill nets on the trawling grounds hampered operations at two of the stations.

The "bloaters" (*L. hoyi*) taken in Pike's Bay differed from those taken in deeper areas or in the open lake. The Pike's Bay variety were fatter fish and had larger eyes and less pigment on the head. The fins were often red. A large sample of these fish was preserved for morphological studies.

Trawl catches at the index stations were light and consisted mainly of slimy muddlers, ninespine sticklebacks, *L. hoyi*, and smelt.

Other activities included continuation of standard gangs of gill nets at various depths and locations to learn more of the bathymetric and areal distribution of fish. The fishing localities were: south of Oak Island (22 fathoms); east of Frog Bay (18 fathoms); east of Outer Island (65 fathoms); and north of Ironwood Island (27 fathoms).

In an attempt to capture fry and yearling stages, trawl tows were made southeast of Cat Island, west of Outer Island, east of Frog Bay, southeast of Michigan Island, and north of Ironwood Island. A $\frac{1}{2}$ -meter plankton net (32 grit cloth) was also towed at these locations. Fish larvae were captured north of Ironwood Island at depths of 9 and 25 feet below the surface in 27 fathoms of water. The species most commonly caught in the trawl at nearly every location were slimy muddlers, ninespine sticklebacks, trout-perch, and smelt. In addition, *L. hoyi* and 4 small lake trout (8.2 to 13.6 inches) were taken southeast of Cat Island; whitefish (3.0 to 8.0 inches), pygmy whitefish, and one 4-inch lake trout were taken west of Outer Island; round whitefish (3 to 4 inches) and small (3 to 6 inches) unidentified coregonids were taken southeast of Michigan Island; lake trout (4 to 14 inches), whitefish (6 to 15 inches), *L. hoyi*, and pygmy whitefish were taken north of Ironwood Island.

Trawl tows were made east of Frog Bay to locate the 18-month-old lake trout planted from shore by the Wisconsin Conservation Department in early May. A tow in 9 to 11 fathoms just offshore from the planting site took no fish. Another tow farther offshore in 17 fathoms captured 19 small lake trout, 9 of which were 6 to 8 inches long and had the left pectoral fin clipped. These individuals were obviously from the Wisconsin plant. This discovery is comforting, as these young trout planted from shore apparently found a desirable environment as quickly as fish planted from a boat (the usual planting method).

A skiff powered with an outboard motor was used to make several tows with a $\frac{1}{2}$ -meter plankton net

along the south shore of South Twin Island over a rocky bottom in 6 to 15 feet of water. Several extremely small fish larvae were captured.

The water was vertically homothermous at all stations. Surface temperatures varied from 37.4° F. northeast of Bear Island to 45.5° F. east of Frog Bay.

Note: Also see Commercial Fisheries Review, July 1960 p. 29.



Gulf Exploratory Fishery Program

EXPERIMENTAL MIDWATER TRAWLING OFF THE MISSISSIPPI DELTA:

M/V "Oregon" Cruise 67: A 6-day cruise (ending June 2, 1960) was made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon off the Mississippi Delta. The objective was to evaluate a newly designed mid-water trawl, but a scarcity of midwater schools and a malfunctioning telemeter prevented any testing. Transects were made over the 30- to 40-fathom areas which had large concentrations of mid-water fish during the previous December and March cruises, without finding any indications of fish at this time.

When traversing the 65-70 fathom area, just before sunset, fish were observed, on the echograph, rising from the bottom, forming into schools at 50 fathoms, and rising to 10-15 fathoms at sunset, then dispersing over the surface at dusk. The reverse cycle was observed the following morning at dawn. An unsuccessful attempt was made to capture these schools where they were forming at 50 fathoms and at 10-15 fathoms before dispersal. A mercury-vapor light failed to draw fish to the surface at night, although fish were observed at 5-10 fathoms below the vessel on echograph tracings. During daylight several short tows with a 40-foot shrimp trawl over the rough bottom where the schools dispersed produced the same species of scud (Decapterus punctatus) that had been taken in midwater schools in the earlier cruises.

Ten bushels of scallops (Pecten gibbus) were dredged from 16 fathoms between Pensacola and Mobile for study.

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SHRIMP-TRAWL UNDERWATER PERFORMANCE STUDIES CONTINUED:

M/V "George M. Bowers" Cruise 26: The study of shrimp-trawl performances was continued by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers off Eleuthra, British West Indies, and Panama City, Fla., between April 12-June 10, 1960. Observations and 9,600 feet of motion picture film of shrimp trawls were made by divers who rode a diving sled towed by the George M. Bowers. Trawls photographed were a 40-foot flat net, 2- and 4-seam semi-balloon nets, and a try net.

Note: Also see Commercial Fisheries Review, November 1959 p. 39, and January 1960 p. 39



Hawaii

BELOW-AVERAGE SKIPJACK TUNA SEASON PREDICTED:

Although the early part of the year is the "off-season," 1960 skipjack landings in Hawaii through April were only 70 percent of last year's landings and 87 percent of the average for the last 10 years. Three size-groups were present in the catch: 2.5 lbs., 9.5 lbs., and 25.7 lbs. Fish in the first two groups were the most common. Live bait (nehu) was also scarce.

Surface temperature data from Koko Head, Oahu, indicate that the advection of California Current Extension water into the Hawaiian Islands area will be weak and/or late this year. In previous years this condition has been associated with below-average skipjack catches. A below-average season was predicted by the U. S. Bureau of Commercial Fisheries at the end of March. Temperature data for April have not changed the prediction.



King Crab

TAGS FROM UNITED STATES TAGGING PROGRAM RETURNED BY RUSSIANS:

The King Crab Investigation of the U. S. Bureau of Commercial Fisheries received 34 tags recovered by the Russians while fishing in the Bering Sea. The recoveries were made between

July 17 and September 12, 1959, and included tags from live king crabs tagged



and released by United States biologists in 1957-59. The Russians also supplied recovery information.



Maine Sardines

CANNED STOCKS, JUNE 1, 1960:

Distributors' stocks of Maine sardines totaled 197,000 actual cases on June 1,

compared with 272,000 cases packed in the same period of 1959. The 1959 pack for the season which ended on December 1, 1959, was 1,753,000 standard cases.

The total supply (pack plus carryover beginning of season) for the season from April 15 to December 1, 1959, was 2,171,000 standard cases, somewhat lower than the total supply of 2,434,000 cases the previous season. The carryover on April 15, 1960, was 335,000 cases as compared to 420,000 cases on April 15, 1959.



Michigan

USE OF OTTER TRAWLS PERMITTED IN SOUTHERN LAKE MICHIGAN:

Conditioned by a zone restriction, a change was approved in Michigan's commercial fishing regulations in May 1960, by the Conservation Commission which would permit the use of otter trawls in southern Lake Michigan. The State's Governor signed an emergency order which placed the regulatory change in effect June 12.

Table 1 - Canned Maine Sardines--Wholesale Distributors' and Cannery Stocks, June 1, 1960, With Comparisons¹

Type	Unit	1959/60 Season				1958/59 Season				
		6/1/60	4/1/60	1/1/60	11/1/59	7/1/59	6/1/59	4/1/59	1/1/59	11/1/58
Distributors	1,000 Actual Cases	197	252	235	296	176	197	254	268	312
Cannery	1,000 Std. Cases ^{2/}	235	397	843	1,001	422	272	474	591	1,037

^{1/} Table represents marketing season from November 1-October 31.

^{2/} 100 $3\frac{3}{4}$ -oz. cans equals one standard case.

Note: See *Commercial Fisheries Review*, July 1960 p. 32 and March 1960 p. 22.

Correction: In table 1 on p. 22 of March 1960 *Commercial Fisheries Review*, the season heading "1957/58 Season" should read "1958/59 Season."

1960, the same amount on hand June 1, 1959. Stocks held by distributors on January 1, 1960, amounted to 235,000 cases, and on April 1, 1960, totaled 252,000 cases, according to estimates made by the U. S. Bureau of the Census.

Cannery stocks on June 1, 1960, totaled 235,000 standard cases (100 $3\frac{3}{4}$ -oz. cans), a decrease of 37,000 cases (14.0 percent) as compared with June 1, 1959. Stocks held by cannery on January 1, 1960, amounted to 843,000 cases and on April 1, 1960, totaled 397,000 standard cases.

The 1960 pack (from the season which opened on April 15, 1960) as of June 25 was about 194,000 standard cases as

Under the new regulation, the Conservation Department is authorized to issue trawling permits for netting "bloater" chubs, herring, alewives, and smelts. It also is charged with regulating the kind and size of trawls, their mesh sizes, and the areas, and time and manner in which this new type of fishing gear may be used. How many permits will be issued and on what basis remains to be determined as do a number of other administrative matters.

The Commission gave Department officials clear-cut instructions in a resolution limiting the use of trawls to Lake Michigan in an area south of Ludington to the Indiana border and west to Wisconsin waters.

North Atlantic Fishery Investigations

DECREASE IN HERRING DISEASE IN GULF OF ST. LAWRENCE:

Gulf of St. Lawrence herring were sampled during May 1960 by U. S. Bureau of Commercial Fisheries Biologists as part of the continuing epidemiological study of a fungus (*Ichthyosporidium*) disease. Examination of the samples disclosed that the incidence of disease in the Gulf has continued to slump following the 1954/55 outbreak, and is now at a very low ebb. These results agree with the general picture that emerged following the 1947 Gulf of Maine outbreak--a rapid decrease in incidence during the five years immediately following the epidemic.

Herring landings in the Gulf of St. Lawrence have shown signs of increasing this year--the first time this has been true since the disease outbreak. If the trend continues, it may indicate that year-classes spawned after the outbreak have not been seriously affected by the disease. This is supported by the observation that much of this year's catch is composed of disease-free recruit spawners.

POPULATION AND DENSITY OF SEA SCALLOP BEDS ON GEORGES BANK STUDIED:

M/V "Delaware" Cruise 60-8: A survey of the population structure and den-



The Service's research vessel Delaware.

sity of the sea scallop beds on Georges Bank was conducted (May 23-29, 1960), by the U. S. Bureau of Commercial Fisheries research vessel Delaware.

A total of 60 10-minute tows was made using a 10-foot dredge with a 2-inch ring bag. An odometer was towed behind the dredge to measure the distance traveled over the bottom. All live scallops and clam shells were measured; sex ratios taken; gonads collected; and meats collected for length-weight ratio.

Results of the survey have not yet been analyzed, but in general the biologists did not find large numbers of the year-class which will be recruited this year and did find an unusually large number of clamper or dead shells in some areas.

UNDERWATER TELEVISION OFFERS NEW OPPORTUNITIES FOR FISHERY RESEARCH:

Biologists at the Woods Hole Biological Laboratory of the U. S. Bureau of

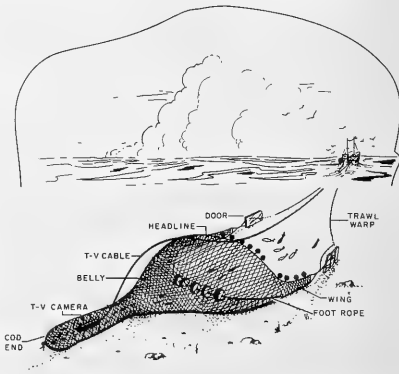


Fig. 1 - An otter trawl with the underwater television camera in the cod end.

Commercial Fisheries now are able to extend their studies with the help of underwater television to include observations of fishes as they are caught in otter trawls. The specially-designed television camera is suspended within the cod end of the trawl and the image transmitted over a coaxial cable to a receiver on board the

vessel. Continuous observations or motion picture recordings of the fish in the submerged net can be made by biologists in the comparative comfort of a ship-board laboratory.

A major problem in savings-gear studies has been the behavior of fishes in the trawl. Do the small fish actually try to escape through the meshes, as the biologists hoped they would? Do trash fishes clog the meshes, thus blocking the escape of immature cod fishes? Underwater television will now help to supply answers to these and other questions.



Fig. 2 - Biologist on board observing fish.

Careful analysis of motion picture recordings of the television screen has uncovered some interesting facts of species differences in behavior. For example, haddock seem to explore the confined area within the cod end, crossing from one side of the trawl to the other. In contrast, sand lance, an important marine forage species, seem in a hurry to escape through the meshes and usually do so in very rapid fashion.

Many future underwater television studies are planned by the Woods Hole Laboratory. One such study will examine the relationship between the swimming ability of fishes and the speed of the trawl moving over the ocean floor.



Oysters

UNDERWATER HARROW SHOWS PROMISE IN CONTROL OF STARFISH:

Experiments previously carried on at the U. S. Bureau of Commercial Fisheries Biological Laboratory at Milford, Conn., demonstrated that oyster drills can be killed by burial in soil. In order to further test this method as a means of controlling oyster predators, the Bureau has entered into a contract with a New Haven, Conn., Oyster Company. A disc harrow, similar to equipment used in agriculture, is being used on an oyster bed in Long Island Sound to turn over the bottom sediment and bury any drills and starfish present. SCUBA divers are being used to observe the harrowed areas at periodic intervals.

Further tank experiments using three types of substratum are also being conducted. Starfish completely buried in one inch of mud could not emerge and died in three to four days. Even when incompletely buried, with one or two rays protruding, approximately 80 percent were killed. Similar results were obtained in substrates of mud and shell and in sand.



Radioactive Waste

DISPOSAL SITES OFF NEW ENGLAND COAST SURVEYED:

A survey of a site off Boston Harbor formerly used for the disposal of limited quantities of packaged radioactive wastes has not revealed any radioactivity attributable to the disposal operations.

Samples of water, sediments, and marine organisms living in the area were collected by the U. S. Coast and Geodetic Survey and were analyzed for radioactivity by the U. S. Public Health Service at its Engineering Center in Cincinnati. The radioactivity detected was found to be in the same range as that of background activity at other ocean locations where there has been no disposal of radioactive wastes.

The site was used under Atomic Energy Commission (AEC) authorization and license from 1952 to August 1959, by a Boston disposal corporation, for the disposal of low-activity packaged radioactive wastes which had a total of 2,434 curies at the time of disposal. The former site is an area two miles in diameter located at 42° 25.5' N. lat. and 70° 35' W. long., 15 miles off Boston Harbor in Massachusetts Bay.

The license of the company was amended by the AEC in August 1959 to require the firm to carry out its operations in deep water (1,000 fathoms) off the continental shelf. No further use of the area off Boston Harbor for disposal purposes is contemplated. The Commission's present policy is to require that wastes be disposed of in water at

least 1,000 fathoms deep and the Commission is not contemplating any change in that policy.

The Massachusetts Bay site is one of four off the New England coast studied during the past year by scientists from the University of Connecticut, the U. S. Coast and Geodetic Survey, and the U. S. Public Health Service, working in conjunction with the Bureau of Commercial Fisheries of the U. S. Fish and Wildlife Service. The work was part of a research program financed by the Atomic Energy Commission.

While the studies have indicated that each of the four inshore locations would be capable of providing sufficient dilution to dispose safely of 250 curies per year of strontium 90 or its equivalent, the Commission has no plan to use or approve the use of these sites. The surveys were conducted from a long-range point of view—to gather information for use should a need ever arise.

One of the four locations surveyed, the southern half of a restricted area known as No Mans Land (off Martha's Vineyard Island) and used as a Naval gunnery range, was dropped from consideration. The scientists agreed that the site was safe for the disposal of limited amounts of packaged radioactive wastes, but pointed out that nearby ocean locations are popular with fishermen, and tidal and nontidal currents through the site are predominantly landward.

The two remaining sites studied were a 25-square-mile area centered at 42° 13.4' N. lat. and 69° 45' W. long., approximately 75 nautical miles northeast of the No Mans Land area and a 25-square mile area centered at 40° 45' N. lat. and 70° 52.7' W. long., approximately 28 nautical miles south of the No Mans Land site.

Note: Also see Commercial Fisheries Review, June 1959 p. 28.



Salmon

CALIFORNIA COMPLETES KING SALMON MARKING FOR 1960 SEASON:

Despite a disease outbreak in the salmon hatchery this spring which threatened to scuttle the program, the California Department of Fish and Game's Marine Resources Branch completed its king salmon marking project for this year. It is expected that marking will be resumed next year.

The disease broke out in the U. S. Fish and Wildlife Service's Coleman Hatchery in March, halting marking, which had begun in February. The disease, still under study, disappeared in April and the marking project was completed by mid-May.

Over 1 million marked fish were released into the Sacramento River drainage in three lots, each lot with a different marking. One group was placed in a river tributary near the hatchery; another group was trucked to Rio Vista; and the third lot was taken by boat from Rio Vista to water of about 50-percent salinity usually upper San Pablo Bay.

Purpose of the experiment is to learn the effect of fresh-water hazards on the king salmon run. These hazards include predation, stream diversions, and pollution.

None of the fish marked in 1959 has shown up in the 1960 catch yet, but a Department Biologist says some may show up in the sport catch as two-year-old fish this summer. The majority are expected to appear in the sport and commercial catch beginning in the winter of 1961.

Between 50,000-68,000 fish in each lot were released weekly. The State's Darrah Springs Hatchery hauled fish from Coleman to Rio Vista and a Federal truck took the fish from Coleman Hatchery to Battle Creek, a Sacramento River tributary not far from Coleman.



Tuna

ALBACORE CATCHES BY CALIFORNIA PARTY BOATS MAY INDICATE GOOD SEASON:

California party-boat fishermen late in June 1960, had their first chance in nearly two years at albacore tuna and may get a few more chances, if the favorable oceanic conditions continue, biologists of the California Department of Fish and Game's Marine Resources Operations predicted on July 1.

A few albacore had been caught near San Clemente Island by June 22 and by June 25 at least 500 had been recorded by party-boat fishermen. The fish were taken between 10 and 40 miles off San Clemente Island at the extreme outer range of the sport fleet and right where the Department figured they would be.

In all of last year, only 39 albacore were reported taken by sports fishermen and the previous year only 6,482 had been caught. These figures are a far cry from the peak years of 1955, 1956, and 1957 when sports fishermen landed 78,000, 65,000, and 41,000 albacore, respectively.

While the initial success off San Clemente is no guarantee of a good albacore season in 1960, the Department has

reason to believe the early catches may herald a return to the good days of the recent past. At the very least, fishermen should experience successes at least as well as they did off San Clemente in late June.

Reason for the Department's cautious optimism about the 1960 season may be found in the log book of the State's Fish and Game research vessel *N. B. Scofield*, which recently completed an extensive 3,000-mile 26-day cruise into the offshore waters of California and Baja California. Purpose of the trip was to intercept albacore schools prior to their appearance on the local fishing grounds and to follow them into areas of commercial concentrations.

Fisheries scientists concluded that local conditions seem more suitable than they have for the last several years for the fish to move relatively close to shore as the season progresses.

The initial albacore catch on the research vessel's cruise was made about 500 miles west of San Francisco. From that point catches continued throughout the survey in a generally southeasterly direction to as far south as 275 miles west of San Quintin, Baja California. The southernmost catches tend to bear out once again the Department's earlier prediction, based on April oceanic conditions, that fishing south of Guadalupe Island, Mexico, should be comparatively poor.

No commercial concentrations of fish were found. The albacore were widely scattered throughout most of the survey area in water temperatures ranging from 60-64° F. Best fishing was found in the small temperature range of 61-62° F.

ALBACORE MIGRATIONS AND DISTRIBUTION STUDIED BY OREGON BIOLOGISTS:

Another albacore tuna exploratory cruise by biologists of the Oregon Fish Commission was scheduled to start the last week of June. A vessel chartered by the Commission will collect basic oceanographic data and study the migration and distribution of the albacore tuna.

The albacore, which was recognized commercially when first caught off the coast of Oregon in 1936, reached a production peak of 22 million pounds in 1944 and about 10 years later the catch fell to 0.5 million pounds. The decline in catch is not a case of depletion, but rather is due to the migration of these fish. It is with this erratic behavior of the albacore that Commission biologists are concerned.

Oregon offshore waters will be studied and the albacore caught will be tagged and returned to sea. Water temperature, salinity, and clearness will be related, if possible, to the presence or abundance of albacore. The findings will be ultimately passed along to the commercial troll fleet so that the fishery can be developed to a greater efficiency.

Albacore, it is now known, follow a drift of warm clear blue water between 30 and



100 miles offshore, beyond a colder, murkier band of water closer to shore. According to the biologists, most of the albacore caught and tagged in 1959 were about 25 inches long. It is believed, too, that no albacore were taken during the 1959 cruise north of the line approximately west from the Umpqua River, in spite of the high temperatures (in excess of 61° F.) encountered north of that point.

The spawning areas of albacore are probably somewhere in the mid-Pacific. The young fish make extensive feeding migrations to distant reaches of the Pacific. It is during these feeding journeys that albacore appear along the coast of Oregon. One tagged by the Oregon Fish Commission was recovered 10 months later off the coast of Japan--a journey of 5,000 miles.

Albacore catches vary widely from year to year. The reasons for this great fluctuation are not fully understood. Ocean currents, water temperature, or food supply undoubtedly influence the availability of fish. Some years landings by the commercial vessels are influenced by market conditions.

An Oregon State College Department of Oceanography biologist was to take part in the Oregon Commission's cruise. Other College biologists also will make studies of their own at the same time in a separate vessel.

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ALBACORE TAGGED IN 1956 OFF SAN FRANCISCO RECOVERED BY JAPANESE:

An albacore tuna tagged and released off San Francisco, Calif., by biologists of the U. S. Bureau of Commercial Fisheries, Honolulu Biological Laboratory, was recaptured by a Japanese tuna longliner about 1,000 miles southeast of Tokyo Bay, in the vicinity of Marcus Island. This fish was tagged by the Bureau's research vessel Charles H. Gilbert on November 15, 1956, and was recaptured by the Japanese vessel, No. 2, Hayatori Maru of Iwate Prefecture, Japan, on March 13, 1960, after a period of 3 years and 4 months. This is the longest period thus far noted between tagging and recapture.

This marked the 17th recovery of an albacore tuna tagged by the Honolulu Laboratory. Other recoveries in the past have also demonstrated considerable trans-Pacific movements extending from the United States west coast to the vicinity of Tokyo Bay, indicating that there is probably a single population of this valuable tuna species in the North Pacific.



U. S. Foreign Trade

CONFERENCE HELD ON UNITED STATES FISHERY EXPORT TRADE PROMOTION:

A special conference was held on June 20, 1960, between representatives of the fishing industry and Federal Agencies to consider the present export situation and to obtain the advice of industry as to specific moves the Government might undertake to give maximum assistance in increasing sales of United States fishery products abroad. This meeting was part of a series of conferences being held under the Executive Department's program to promote the expansion of United States exports.

Consideration was given to ways of strengthening the trade promotion services of the Government, to expanding and giving higher priority to the commer-

cial activities of the Foreign Service, to placing greater emphasis on the prompt reporting of information useful to United States exporters, to making fuller use of trade fairs, trade missions, and other means to stimulate the interest of foreign buyers in United States fishery products. Also, specific suggestions were sought on the following subjects: (1) kinds of fishery products that could be sold abroad; (2) where these products could be marketed; (3) reductions in duties, or in quantitative restrictions that might benefit our exports; (4) other barriers to trade that, if lessened or removed, might benefit our exports; and (5) other actions that the Government can take to serve the fishing industry better abroad.

The meeting was held in Washington, D. C., and was open to interested industry representatives who wished to participate. Those planning to attend were asked to submit, prior to the meeting, a summary concerning specific ways that the Government may facilitate the export of fishery products. Interested persons, unable to attend, submitted in writing, prior to the meeting, their comments and recommendations on the items considered.

Methods by which Government agencies can help the American fishing industry increase exports to foreign markets are being studied by the U. S. Department of the Interior as a result of the Government-industry export conference.

The conference was sponsored by the Department of the Interior with cooperation of the Department of Commerce and State. It was attended by representatives of a number of the major fishing and fish processing industries. Also, participating in the meeting were representatives of the Export-Import Bank and the Federal Trade Commission.

At the conference it was suggested that the industry should aim specifically at foreign markets by preparing fishery products to meet the consumer preference of persons in other countries and not merely attempt to market abroad products prepared for the American consumer. Numerous examples of differences of consumer preferences were given. It was generally agreed, however, that more knowledge of the tastes and desires of consumers in other countries is necessary if the American processor is to gear for the foreign market. It was also suggested that more active price competition might increase exports.

Industry spokesmen at the conference also pointed out numerous trade impediments such as high tariffs and taxes, import licenses, excessive exchange guarantees as well as transportation cost differentials, and labelling requirements.

Other speakers pointed out the need for more prompt and precise reporting of foreign market conditions, on prices of foreign products, costs of production and the intent of foreign countries to purchase fishery products, the need for better export credit facilities and risk insurance, especially for small companies.

Other matters stressed included the need for more promotion of American fishery products in foreign fields and the necessity of having commercial officers abroad who have experience in fisheries.

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EDIBLE FISHERY PRODUCTS, APRIL 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during April 1960 decreased by 5.5 percent in quantity and 6.2 percent in value as compared with March 1960. The decrease was due primarily to substantially lower imports of frozen albacore tuna (down 6.3 million pounds) and, to a lesser degree, a decrease in the imports of frozen shrimp, frozen and canned salmon, canned sardines, and fillets other than groundfish. The decrease was partly offset by increases in the imports of groundfish fillets (up 2.6 million pounds), frozen tuna other than albacore, and canned tuna in brine.

Compared with April 1959, the imports in April this year were lower by 16.1 percent in quantity and 12.7 percent in value due to substantially lower imports of groundfish fillets (down 4.6 million pounds), frozen tuna other than albacore (down 7.5 million pounds), and to a lesser extent, frozen albacore, canned and frozen salmon, and frozen shrimp. Offsetting the drop were increases in the imports of canned sardines and canned tuna in brine.

United States Imports and Exports of Edible Fishery Products,
April 1960 with Comparisons

Item	QUANTITY			VALUE		
	April		Year	April		Year
	1960	1959	1959	1960	1959	1959
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & Shellfish Fresh, frozen, & processed/ . . .	75.8	90.4	1,070.5	22.6	25.9	309.8
Exports:						
Fish & Shellfish Processed only ^{1/} (excluding fresh & frozen)	3.5	5.2	68.0	1.3	1.1	22.8

^{1/}Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in April 1960 were higher by 1.9 percent in quantity and 44.4 percent in value as compared with March 1960. Compared with the same month in 1959, the exports this April were lower by 18.2 percent in quantity, but were higher by 18.2 percent in value. The lower exports in April this year as compared with the same month in 1959 were due to the small supplies available of fishery products that contribute substantially to

the United States export trade in these products.

The relatively high value of the fishery products exported this April over April 1959 would indicate that the April 1960 exports were made up of the higher-priced products such as canned salmon and frozen shrimp.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA AS OF JUNE 4:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the 12½-percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-June 4, 1960, amounted to 18,262,874 pounds, according to data compiled by the Bureau of Customs. From January 1-May 30, 1959, a total of 17,689,773 pounds had been imported.

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IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-MARCH 1960:

During the first quarter of 1960, groundfish and ocean-perch fillets and blocks, frozen tuna, canned tuna, and fish meal were imported into the United States in lesser quantities than during the same first quarter of 1959. Lobster and shrimp imports were higher than for the 1959 period. In the fishery export trade there were gains in shrimp, fish oils, and squid; declines were noted in canned salmon and canned sardines.

Imports: GROUNDFISH AND OCEAN-PERCH FILLETS AND BLOCKS: Imports (32,194,000 pounds) were 14 percent less than during the first three months of 1959. Icelandic, Norwegian, and Danish shipments were lower than those of the like period of 1959; Canadian shipments were higher.

TUNA, FRESH OR FROZEN: The frozen tuna imported during the first quarter of 1960 (51,214,000 pounds) was below imports for the comparable period of 1959. A 70-percent increase in imports of frozen albacore tuna was not sufficient to overcome a 47-percent decrease in receipts of other frozen tuna, primarily yellowfin. Japanese shipments of other frozen tuna were less than one-half those for the same 1959 period; Peruvian shipments were less than two-thirds the level of the first quarter of 1959.

TUNA, CANNED IN BRINE: During January-March 1960, total imports of canned white-meat tuna in brine (2,254,000 pounds) were 4 percent above those of the comparable period of 1959. Imports from Japan, however, were down 23 percent. Increased imports were received from Spain and other countries. Larger receipts of Spanish canned albacore have resulted from the devaluation of the Spanish currency.

Total imports of canned-light-meat tuna in brine (6,649,000 pounds) were 26 percent below those of the first quarter of 1959. Imports from Japan were down 37 percent. The 1960 quota of all canned tuna in brine which may enter the United States at the 12-1/2-percent rate of duty was fixed at 53,448,330 pounds.

SHRIMP, MOSTLY FROZEN: Imports of shrimp (24,798,000 pounds) were 2 percent higher than those of the first quarter of 1959. Mexico, the largest supplier, accounted for nearly two-thirds of the total. Receipts from Japan fell to less than one-third those of the similar period of 1959.

SALMON, CANNED AND FRESH OR FROZEN: Imports of canned salmon (10,083,000 pounds) declined 21 percent from those of January-March 1959; Japan supplied nearly all of this product. Likewise, imports of fresh and frozen salmon (1,427,000 pounds) were down 35 percent from those during the like months of 1959; Canada supplied the entire amount.

LOBSTER AND SPINY LOBSTER, FRESH OR FROZEN: During the first quarter of 1960, both imports of northern lobster (2,857,000 pounds) and spiny lobster (10,319,000 pounds) were higher than those of the same period of 1959. Imports from Canada were up 36 percent. The principal increases in receipts of spiny lobster were noted from the Union of South Africa and Australia, each of which were up 65 percent.

CANNED CRABMEAT AND CANNED OYSTERS: Imports of canned crab meat (929,000 pounds) fell 46 percent; imports of canned oysters (1,477,000 pounds) rose 5 percent. Japan supplied nearly all of these products.

FRESH OR FROZEN SEA SCALLOPS: During the first quarter of 1960, Canada shipped 70 percent more than in the like period of 1959. Imports from Japan fell 30 percent. Total imports of sea scallops (888,000 pounds) were 29 percent higher than during January-March 1959.

CANNED SARDINES: Imports of canned sardines in oil (5,483,000 pounds) were 3 percent higher during the first quarter of 1960. Imports of canned sardines not in oil (3,079,000 pounds) rose sharply, and receipts for the first quarter were three times those received during the entire calendar year of 1959. This was due primarily to the lower supplies of domestic packs of sardines not in oil.

FISH MEAL: During the first quarter of 1960, imports of fish meal (35,704 tons) were down 37 percent from the same period of last year. Peruvian fish meal accounted for nearly 50 percent of the total trade. No fish meal was received from Angola, which supplied almost one-third of the imports in the first three months of 1959.

FISH SOLUBLES: Denmark supplied 85 percent of the fish solubles during January-March 1960. Total imports (2,176,000 pounds) were down about 8 percent from the same period of 1959.

Exports: CANNED SARDINES, NOT IN OIL: Exports for the first quarter of 1960 (6,912,000 pounds) were down about 19 percent from those of the same period of 1959. The sharpest decline was in exports to Cuba, which took only 29,000 pounds as compared with 1,277,000 pounds during January-March 1959.

CANNED SALMON: Owing to reduced shipments to the Philippines in the first quarter of 1960, exports of canned salmon (1,350,000 pounds) declined 53 percent. The United Kingdom took more than twice as much canned salmon as in the comparable period of 1959.

SHRIMP, FRESH OR FROZEN AND CANNED: Exports of canned shrimp (604,000 pounds) were 9 percent above those of January-March 1959; exports of fresh or frozen shrimp (636,000 pounds) were 70 percent higher. Canada took the major share of these products.

CANNED SQUID: During January-March 1960, exports (4,577,000 pounds) were over nine times those of the same period of 1959. The Philippines took 85 percent of the total. In April 1960, however, the Central Bank of the Philippines changed the import classification of squid from the decontrolled category to the nonessential consumer

category. This change will make foreign exchange necessary to pay for imports of squid, more expensive as well as more difficult to obtain. An adverse effect may be expected in the trend in Philippine imports of United States canned squid.

FISH OILS: During the first quarter of 1960, northern European countries took practically all the fish oil exports. Total exports in that period of 29,053,000 pounds were 56 percent more than during the same quarter of 1959.

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WORLD MARKETS FOR UNITED STATES FISHERY PRODUCTS IN 1959:

The value of United States exports of fishery products in 1959 was the highest since 1947. Exports, valued at \$44,241,000, were 43 percent above those of 1958, although 16 percent less than the peak level reached in 1947.

Country	1959	1958	1957	1956	1955
(US\$1,000)					
United Kingdom	8,928	5,785	3,708	2,204	3,706
Canada	8,644	9,200	7,253	8,107	10,037
Philippines	5,587	2,578	6,027	8,065	8,556
Netherlands	4,352	2,007	2,969	4,961	7,201
Sweden	3,176	681	1,844	848	308
West Germany	2,888	3,043	5,059	6,121	1,900
Norway	1,296	1,063	970	1,065	991
Japan	928	501	669	595	610
Mexico	663	393	175	143	112
Cuba	787	490	721	743	676
Venezuela	614	641	573	586	442
Belgium & Luxembourg	746	948	447	504	464
France	766	68	259	428	206
Switzerland	762	387	463	473	317
Italy	303	158	259	339	139
Greece	306	136	195	261	213
Other	3,495	2,925	4,321	4,060	4,099
Total	44,241	31,004	35,952	39,503	39,977

In value of products taken, the United Kingdom was the leading foreign market for United States fishery products during 1959. In September 1958, British import restrictions were completely removed on canned salmon imports from the dollar area. In 1959, United States shipments of canned salmon to the United Kingdom increased \$2,569,000 above the previous year. In 1959 the United Kingdom received from the United States: canned salmon \$8,321,000, other fishery products \$607,000; total \$8,928,000.

Canada, another leading market in recent years, was only slightly behind the United Kingdom. Canada purchased a wide variety of United States products: canned shrimp \$1,894,000; fresh or frozen shrimp \$1,396,000; oysters \$571,000; seal fur \$1,537,000; fish and marine-animal oils \$361,000; other fishery products \$2,885,000; total \$8,644,000.

The Philippines has been a good market for United States fishery products. Although United States products still receive preferential tariff treatment in that market, the margin of preference is being gradually reduced. In 1959, the principal products taken were: canned California sardines \$3,851,000; canned salmon \$1,005,000; canned squid \$594,000; other fishery products \$137,000; total \$5,587,000.

Country	Fish and Marine-Animal Oils	Other	Total Fishery Products
(US\$1,000)			
Netherlands	3,828	524	4,352
Sweden	2,989	187	3,176
West Germany	2,552	336	2,888
Norway	1,193	103	1,296

In 1959, United States fishery exports to the Netherlands, West Germany, Norway, and Sweden were primarily fish and marine-animal oils. The importance of fish oils, mainly menhaden oil, to the total, is shown in table 2. Canned salmon provided a large part of the "other" products: \$363,000 for the Netherlands; \$166,000 for West Germany; and \$133,000 for Sweden.

United States exports to Japan, valued at \$928,000 in 1959, consisted primarily of unmanufactured shells, valued at \$867,000. Shipments of unmanufactured shells were nearly double those during 1958 and accounted for most of the increase in the total export of fishery products to Japan.

Europe was the leading foreign market for United States fishery products during 1959, taking \$23,671,000, or more than the value of trade to the rest of the world combined (table 3). The European market was shared primarily on two products, fish oils valued at \$11,280,000 and canned salmon at \$8,816,000.

Table 3 - United States Exports of Fishery Products by Area of Destination, 1959

Area	Edible	Inedible	Total
	(US\$1,000)		
North America	8,081	3,537	11,618
South America	902	58	960
Europe	10,923	12,748	23,671
Asia	6,093	1,098	7,191
Africa	251	5	257
Oceania	495	49	544
Total	26,745	17,496	44,241

In recent years, four products—fish oils, canned salmon, canned sardines, and canned shrimp—have provided over half of the annual exports of United States fishery products (table 4).

Table 4 - Four Products Provided Over Half of United States Fishery Products in 1959

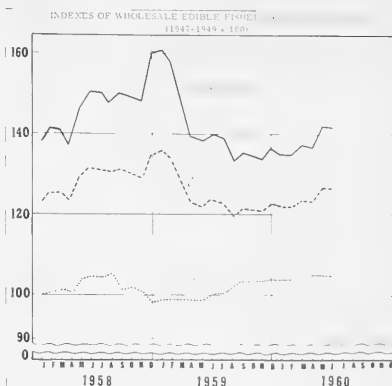
Product	Value	Percent of Total
Fish oils	\$11,902,000	27
Canned salmon	10,839,000	24
Canned sardines	5,843,000	13
Canned shrimp	2,898,000	7
Other	12,959,000	29
Total	\$44,241,000	100



Wholesale Prices, June 1960

The wholesale price index for edible fishery products (fresh, frozen, and canned) for June 1960 at 126.3 percent of the 1947-49 average was about unchanged from the preceding month. Increases in wholesale prices for fresh small haddock fillets, dressed halibut, fresh king salmon, and minor price increases for several other items were more than offset by price declines in shrimp and freshwater items from the Great Lakes. From June last year to this June the index rose 2.4 percent due primarily to higher prices for fresh salmon, shucked oysters, frozen shrimp, and canned fish prices.

The index for the drawn, dressed, and whole finfish subgroup this June at 149.7 percent was down 0.3 percent as compared with May, but was 1.2 percent higher than in the same month of 1959. From May to June, price declines for large drawn haddock (down 6.2 percent) and more than offset price increases of 10.9 percent for fresh halibut and 2.4 percent for fresh salmon. June 1960 prices



were higher than in the same month of 1959 because higher prices for dressed salmon (up 7.7 percent) and Lake Superior whitefish (up 1 percent) offset lower prices for fresh haddock, Lake Erie whitefish, and Great Lakes yellow pike.

The fresh processed fish and shellfish subgroup index this June declined 0.7 percent from May due to a 4.7-percent decrease in the fresh shrimp price at New York City. A sharply higher price for fresh haddock fillets at Boston did not offset the lower price for fresh shrimp. Fresh shucked oyster prices were unchanged in June from a month earlier. The June 1960 subgroup price index was up about 5.9 percent from June a year ago due principally to higher prices for shucked oysters (up 19.5 percent) because they are out-of-season in most areas. Lower prices for fresh haddock fillets and fresh shrimp offset to a certain extent the higher shucked oyster prices.



In June this year the index for processed frozen fish and shellfish rose less than one percent from a month earlier. An increase of about one cent a pound in the frozen flounder fillet price and a fractionally higher frozen shrimp price offset declines of about one-half cent a pound in frozen haddock and ocean perch fillet prices. From June 1959 to this June the index for this subgroup dropped 3.3 percent due primarily to lower prices at Boston for frozen haddock fillets (down 25.4 percent) and frozen ocean perch fillets (down 1.8 percent). But these increases were partly offset by an increase of 2.2 percent for frozen shrimp at Chicago.

The canned fish price index remained unchanged in June this year from the preceding month and has moved in a very narrow range since late 1959. However, whole-

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, June 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/} (\$)		Indexes (1947-49=100)						
			June 1960	May 1960	June 1960	May 1960	Apr. 1960	June 1959			
			ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)								126.5	126.6	123.3	123.5
Fresh & Frozen Fishery Products:					142.0	142.2	136.7	139.9			
Drawn, Dressed, or Whole Finfish					149.7	150.1	144.3	147.9			
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.09	.09	88.3	94.1	60.8	109.1			
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.34	.30	103.7	93.5	92.8	105.2			
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.84	.82	189.3	184.8	179.2	175.8			
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.57	.74	141.3	183.4	241.7	140.1			
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.83	1.05	166.9	212.5	212.5	177.0			
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.67	.73	155.9	170.0	234.5	158.3			
Processed, Fresh (Fish & Shellfish):					144.8	145.8	137.1	136.7			
Fillets, haddock, sml., skins on, 20-lb. tins					125.9	91.9	93.6	129.3			
Shrimp, lge. (26-30 count), headless, fresh.	New York	lb.	.82	.86	128.8	135.1	123.2	133.5			
Oysters, shucked, standards	Norfolk	gal.	6.88	6.88	170.1	170.1	164.0	142.3			
Processed, Frozen (Fish & Shellfish):					118.4	117.7	116.2	122.4			
Fillets: Flounder, skinless, 1-lb. pkg.					102.1	98.1	99.5	102.1			
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.25	.26	78.5	80.1	84.8	105.2			
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.28	110.8	112.8	116.8	112.8			
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.80	.80	123.8	123.5	118.0	121.1			
Canned Fishery Products:					104.8	104.8	104.8	100.4			
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	24.50	127.8	127.8	127.8	122.6			
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.10	11.10	80.0	80.0	80.0	77.9			
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	8.00	8.00	93.9	93.9	93.9	83.9			
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	87.5			

^{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.

sale prices this June were up about 4.4 percent from June 1959. Over-all stocks of canned fish remained very light with distributors still depending on the 1959 packs of Pacific salmon and Maine sardines. Supplies of California tomato-pack sardines in 15-oz. cans in the hands of primary distributors have been practically exhausted in recent months, but South African imports have filled the gap.



Wisconsin

EXPERIMENTAL OTTER TRAWLING SUCCESSFUL:

Wisconsin has issued experimental trawling permits to interested industry members; three fishermen with technical assistance from the U. S. Bureau of Commercial Fisheries have been successful. During four months last fall and winter the fishermen took well over

a million pounds of fish. One of them recently purchased a Gulf shrimp trawler which is now fishing in Lake Michigan. The catch of this one firm now averages about 40,000 pounds of fish per day, and they are striving to bring it up to 100,000 pounds per day.



FISH FACT

Lean fish may contain as little as 0.5 percent fat, whereas a few species of fat fish may contain as much as 20 percent fat. Fish can thus be chosen to fit into either low-calorie diets designed for weight reduction or high-calorie diets designed to provide a high level of energy.



International

CARIBBEAN ORGANIZATION REPLACES CARIBBEAN COMMISSION

The Agreement for the establishment of the Caribbean Organization was signed in Washington, June 21, 1960, by France, the Netherlands, the United Kingdom, and the United States.

The Caribbean Organization will be the successor body to the Caribbean Commission, established in 1946 to encourage cooperation in economic (including fisheries) and social development throughout the French, Netherlands, British, and United States areas in the Caribbean. The Organization will have broadly the same objectives as the Commission, but its activities will be directed by a Council on which the following are eligible to be represented: the Republic of France for the Departments of French Guiana, Guadeloupe, and Martinique; the Netherlands Antilles; Surinam; the Bahamas; British Guiana; British Honduras; the British Virgin Islands; the West Indies; the Commonwealth of Puerto Rico; the Virgin Islands of the United States.

This change has been made in response to the express wishes of the peoples of the area. The new Organization will reflect the significant constitutional and economic changes which have taken place in the area since 1946.

After the Agreement has been approved or accepted by the signatory parties they will issue a joint declaration bringing the new Organization into existence. It is hoped that this will be done as early as possible in 1961. The headquarters of the new Organization will be located in San Juan, Puerto Rico, to which the Commission headquarters have recently been transferred.

EUROPEAN FREE TRADE ASSOCIATION

UNITED STATES VIEWS:

The views of the United States on the European Free Trade Association were presented to the Sixteenth Session of the Contracting Parties to the General Agreement on Tariffs and Trade at Geneva, Switzerland, on May 17, 1960, by the U. S. Deputy Assistant Secretary of State for Economic Affairs, who was chairman of the United States delegation to the GATT meeting.

"The present session affords the Contracting Parties their first opportunity to review the Stockholm Convention, one of the more significant post-war developments in international commercial policy." (The Stockholm Convention, signed on November 20, 1959, calls for the formulation of a free-trade area among Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom. The first tariff reduction will take place on July 1, 1960.)

"The European Free Trade Association has now been ratified by all seven member states and will shortly enter into force. In our view it represents an important effort to lower trade barriers and to strengthen economic cooperation among its members. As such it commands the sympathetic and serious consideration of us all. . . .

"Our over-all view of the Stockholm Convention is that, on balance, it deserves the support and approval of the Contracting Parties. While there will be questions concerning specific aspects of the trade arrangements provided for in the convention and, we hope, responsive adjustments on the part of the parties to the convention, nevertheless, as a whole, it is in our judgment in harmony with the spirit and broad objectives of the General Agreement.

"Together, the seven countries which make up the EFTA represent a group with considerable influence on the volume and direction of international trade. Like all regional trading arrangements, the EFTA will mean change. It will require adjustments for producers and consumers inside the Association and in countries which trade with the Seven. These adjustments may raise problems. But they will also provide opportunities. If sound and liberal policies are followed by the Seven in the endeavor they are now beginning, the result can be increased trade and prosperity both for the member states and for their trading partners. Ministers of the Seven meeting at Stockholm on November 20, 1959, pointed out that 'as world trading nations, the countries of the European Free Trade Association are particularly conscious of Europe's links with the rest of the world.' As the EFTA enters into force, the United States is con-

International (Contd.):

fidant that the convention will be carried out in a manner to maximize trade-creating effects and to minimize problems for other countries, both in Europe and in other parts of the world.

"We believe that the procedures whereby the Contracting Parties will consider and, we hope, approve the Stockholm Convention are important. For reasons which we will set forth in detail in the working party my delegation is of the opinion that the provisions of article XXIV alone are not fully adequate to cover the Stockholm Convention. The exemption from the free-trade provisions of the EFTA of the entire economic sector of agriculture and the question as to how the third-country trade in agriculture will be affected by bilateral agreements related to the EFTA seem to us to warrant consideration of the Stockholm Convention by the Contracting Parties under GATT procedures other than those set forth in article XXIV.

"I would like to express satisfaction with the declaration in article 37 of the Stockholm Convention which reaffirms the obligations of member states undertaken in the GATT. Also it is reassuring to have the statement contained in the replies from the member states to the questions submitted by contracting parties that member states intend to administer and interpret the origin rules in a liberal spirit. I think it unnecessary to discuss in detail provisions of the Stockholm Convention relating to quantitative import restrictions. My delegation would, however, like to indicate its view that the imposition, maintenance, and administration of quantitative import restrictions for financial reasons should depend exclusively on the balance-of-payments position of individual member states.

"Mr. Chairman, this in brief is a general statement of our views. . . ." (Department of State Bulletin, June 13, 1960.)

FOOD AND AGRICULTURE ORGANIZATION

VESSELS MOST COSTLY PART OF FISHING:

The fishing vessel itself, not its gear or harbors, processing plants, or the stores needed to sell the products produced, is beginning to be the most costly investment of the world's fishing industry. The investment in fishing boats in highly developed countries runs higher than the investment in harbors, canning plants, and retail stores combined.

A survey by the Canadian government in 1958 showed vessels accounted for 67 percent of the total investment in the Canadian fishing industry. This figure is compared with 45 percent in 1917 and 59 percent in 1935.

The following countries accounted for 92 percent of the world's fish catch. Japan, whose 5,389,000-ton catch led the world in 1957, also leads the world in the variety of fishing vessels in use. Japan has 14 individual major types, followed by the U.S.S.R. with 11 and Norway with 10. The United States has 9 different major types. The United Kingdom, Canada, and Iceland list a total of 7 types; Portugal, France, Sweden, and India, 6 each; the Faroes, Germany, the Netherlands, and Italy 5; Denmark, Indonesia, and the Union of South Africa, 4.

The most popular vessel in use is the trawler in one or other of its various forms--35 nations use it. Then comes the drifter, employed by 29 nations, followed by the

purse-seiner used by 26 nations. The troller is used by 12 nations and the whale catcher by 11.

Time-and-motion studies done on board a new \$840,000 German stern trawler show that stern trawling takes less time than side trawling. While trawling is regarded as the most advanced method of fishing, other methods are constantly improving.

Most boats today are still small--between 60 and 90 feet in length and not costing more than \$100,000--and are too heavy. Generally built of wood, they are constructed on the principle of the thicker the timber the safer the boat. Selecting 22 successful fishing vessels in this class, studies were done on the thickness of the boats' timbers and estimates made as to what thickness could have been safely used. Studies published show Danish boats to be 40 percent and Swedish boats 30 percent heavier than necessary. ("Fishing Boats of the World 2," Fishing News, London, England; book based on papers and discussion at Second FAO World Fishing Boat Congress held in Rome April 1959.)

GENERAL AGREEMENT ON TARIFFS AND TRADE

SIXTEENTH SESSION IN GENEVA:

Problems of major importance for the future development of international trade will confront the 42 countries that participate in the work of the General Agreement on Tariffs and Trade (GATT) which convened in Geneva on May 16, 1960. Among the important subjects to be dealt with at the session will be (1) the elimination of quantitative restrictions on imports, (2) the European Free Trade Association, (3) the Latin American Free Trade Association, (4) the avoidance of market disruption caused by sharp increases in imports of particular commodities, and (5) the trade problems of less-developed countries. Harry Shoshan, International Activities Assistant, Technical Review Staff, will represent the U. S. Department of the Interior at the meetings.

During the Sixteenth Session, the convention of the European Free Trade Association (EFTA), which has recently been ratified by Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom, will be examined. The United States Government together with other contracting parties will consider the convention in the light of relevant provisions of the GATT and seek to assure that the convention will be administered in a liberal manner which guarantees equitable treatment to the trade of countries outside the Association.

Another regional market arrangement, the Latin American Free Trade Association, will also be on the agenda for the session. The arrangement was provided for in the Treaty of Montevideo, signed February 18, 1960, by representatives of four countries which participate in GATT (Brazil, Chile, Peru, and Uruguay) and three which do not (Argentina, Mexico, and Paraguay). It is expected that Contracting Parties will hear a preliminary explanation of the Montevideo Treaty by the signatory countries and that individual countries will indicate their general reactions to the various aspects of the Treaty.

The Contracting Parties decided at their last session, held in Tokyo in November 1959, to study the problem of market disruptions caused by sharp increases of imports over a brief period of time and in a narrow range of commodities. The problem is to find the means to ameliorate the adverse effects of an abrupt invasion of established markets while continuing to provide steadily enlarged opportunities for trade. This problem will be considered at the Sixteenth Session with the help of a factual report which has been prepared on the subject, including a survey of import restrictions which various countries maintain in order to prevent market disruption.

The GATT Committee on Balance of Payments Restrictions holds several series of consultations each year with those countries which still maintain import restrictions to safeguard their monetary reserves. In these consultations, the Contracting Parties examine quantitative import restrictions still in force, their effects, and the prospects for their removal or reduction. The Committee has been an important influence leading to the reduction of quantitative import restrictions, particularly those discriminating against United

International (Contd.):

States exports. Consultations are being held before and during the Sixteenth Session with Austria, Brazil, Greece, India, South Africa, and Uruguay.

The Contracting Parties will review the reports of the committees which have been studying ways to (1) expand international trade in agricultural (including fishery) commodities and (2) assist the exports of less-developed countries. In addition, the Session will deal with a variety of trade issues, including import restrictions maintained by Italy, Germany, and Belgium; developments within the European Economic Community; reports prepared by panels of experts regarding restrictive business practices, subsidies, state-trading enterprises, antidumping and countervailing duties, and facilities for the temporary admission of professional equipment and packing materials; and a number of other matters in the field of international trade.

* * * * *

UNITED STATES PROPOSES LIST OF FISHERY PRODUCTS FOR NEGOTIATION:

The United States has made public an extensive list of imported commodities, including fishery products, on which it will offer to make tariff concessions in the international negotiations at Geneva in September 1960. At the same time the State Department issued a companion list of products on which the United States will seek foreign tariff concessions to boost United States exports. On May 27, 1960, the United States Government announced its intention to participate in the multilateral trade-agreement negotiations under the General Agreements on Tariffs and Trade (GATT). At the same time, it published two lists and notices concerning the preparatory stages for participation in the negotiations. The lists of products proposed to be considered include certain fishery products and were presented to provide full opportunity for all interested persons to make their views known either through public hearing or in writing, as to whether concessions should or should not be offered by the United States or sought from other countries participating in the conference.

Included among the items on the list are such fishery products as fish and marine animal oils; fresh or frozen swordfish; wolffish (ocean catfish) fillets; dried, salted, and smoked cod; canned smoked sardines valued at over 30 cents per pound; canned herring in tomato sauce, kippered or smoked, in containers with contents over 1-pound each; mild-cured salmon; salted herring; smoked or kippered herring; canned clams (except razor clams and clam chowder); caviar and other fish roe; agar agar; and sodium alginate.

One publication (State Department Publication 6986) contains, in addition to explanatory statements and legal notices, a list of products which the United States may consider as a basis for offering tariff concessions in return for concessions of benefit to the United States export trade as may be granted by other countries. The other publication (State Department Publication 6987) contains a list of products of significance to the United States export trade on which the United States may seek concessions from other countries with the view to increasing export opportunities for United States products.

The actual negotiations, sponsored by the GATT, are scheduled to begin in Geneva, Switzer-

land, in September 1960. The conference will be held in two phases, the first concerned with negotiations with the newly-formed European Economic Community (Common Market) and the second, starting January 1961, with an exchange of new concessions between the contracting parties.

These negotiations will be another step in the Government's efforts, through the reciprocal trade agreements program, to promote the expansion of international trade and thereby to foster greater economic strength and solidarity among the nations of the free world.

The lists of products to be considered were issued to provide an opportunity for all interested persons to submit information on whether or not the United States Government should offer or request concessions on individual products. Public hearings before the Committee for Reciprocity Information and the Tariff Commission were scheduled to begin on July 11, 1960. The Tariff Commission in its "peril point" hearing was to investigate the extent to which concessions on listed products may be made without causing or threatening serious injury to domestic industries producing like or competitive products.

Under the Trade Agreements Extension Act of 1958, the President is authorized to enter into trade agreements until June 30, 1962. In negotiating such trade agreements, the President may reduce the United States duties existing on July 1, 1958, to the lowest rate calculated by any of three alternative methods:

1. Reducing the rate by not more than 20 percent, provided that no more than a 10 percent reduction may be made effective in any one year.
2. Reducing the rate by not more than 2 percentage points ad valorem (or its ad valorem equivalent in the case of a specific rate or a combination of ad valorem and specific rates). The reduction in any one year under this alternative may not exceed 1 percentage point.
3. Reducing to 50 percent ad valorem or its equivalent any rate which is in excess of that level, provided that not more than one-third of the total reduction may become effective in any one year.

The President may also agree to "bind" (continue) existing duties or the duty-free treatment for articles on the free list.

The export list was published to obtain the views and supporting information from U.S. exporters concerning additions or deletions, the countries from which concessions should be sought, and the extent of any modification in the customs treatment that should be requested. The possibility of obtaining concessions will depend, in part, on the extent to which the product is supplied or may be supplied by the United States to the country concerned.

The United States expects to negotiate at Geneva with the Common Market, which will represent the six member states (Belgium, France, Germany, Italy, Luxembourg, and the Netherlands), and with Australia, Austria, Canada, Chile, Denmark, the Dominican Republic, Finland, Haiti, India, Israel, Japan, New Zealand, Nicaragua, Norway, Peru, Spain, Sweden, Switzerland, Tunisia, United Kingdom, and Uruguay. Additional countries may, however, decide to participate in the negotiations.

The fishery items proposed to be considered are described in the following tables:

International (Contd.):

Table 1 - List of Fishery Products to be Considered for Possible United States Concession in Duty				
Import Tariff Par.	SCHEDULE A Stat. Class. (1959)	Brief Description	Duty	U. S. Imports 1959
			July 1, 1958	
5	8350 110	Sodium alginate	$\frac{1}{12\frac{1}{2}}\%$	US\$1,000
	2260 260	Salts derived from vegetable oils, animal oils, fish oils; animal fats and greases, n.e.s., or from fatty acids thereof	$\frac{1}{12\frac{1}{2}}\%$	488
34	2220 250	Drugs, advanced in value or condition: Shark-liver oil, including dogfish-liver oil	4% plus .85¢ lb.	142
	2220 260	Shark oil, including dogfish oil	4% plus .85¢ lb.	1/
	2220 270	Fish oils, n.e.s. (except cod oil and herring oil, and not including whale oil)	4% plus 1.25¢ lb.	17
	2220 290	Halibut liver oil	5%	10
	2220 300	Fish-liver oils, n.e.s. (except cod-liver oil)	4% plus 1.25¢ lb.	1,563
41		Glue, glue size, and fish glue: Valued less than 40 cents per pound:		
	0934 000	Glue size and fish glue, n.s.p.f.	0.5¢ lb. plus 74%	242
	0940 300	Valued over 40 cents per pound	4¢ lb. plus 124%	7
	2800 000	Agar agar	15%	992
	0941 700	Isinglass	21%	39
52		Whale oil:		
	0803 000	Sperm, crude	1¢ gal.	1,621
	0803 100	Sperm, refined or otherwise processed	3.5¢ gal.	263
	0803 500	Whale oil, n.s.p.f.	2.5¢ gal. plus 1.25¢ lb.	3
	0808 800	Marine animal and fish oils, n.s.p.f. (except cod, cod-liver, herring, menhaden, sod, and shark oil including dogfish)	10% plus 1.5¢ lb.	6
	0816 000	Seal oil	3¢ gal. plus 1.5¢ lb.	-
	0808 710	Sharkoil, including oil produced from dogfish, n.s.p.f.	4% plus 0.85¢ lb.	-
60	0990 100	Spermaceti wax	2.5¢ lb.	39
	8722 000	Ambergris	10%	16
717(a)	0055 300	Swordfish, fresh	1¢ lb.	1,925
	0055 500	Swordfish, frozen	1.5¢ lb.	947
717(b)	0060 320	Filletted, skinned, boned, sliced, or divided into portions; swordfish	1.5¢ lb.	4,178
	0060 450	Wolfish (sea catfish)	1.5¢ lb.	1,852
717(c)	0062 000	Cod, haddock, hake, pollock, and cusk, dried and unsalted.	5¢ lb.	493
718(a)		In oil or in oil and other substances:		
	0063 560	Sardines, not skinned or boned, smoked, valued over 30¢ per pound	124%	5,358
	0066 200	Antipasto, valued not over 9¢ lb.	22%	-
	0066 300	Antipasto, valued over 9¢ lb.	124%	204
718(b)		Not in oil or in oil and other substances, in airtight containers:		
	0067 000	Anchovies	124%	77
	0067 300	Fish cakes, balls, pudding	5%	360
	0067 600	Herring, smoked or kippered or in tomato sauce, in containers with contents, over one pound each	10%	242
719		Pickled or salted:		
	0068 000	Salmon	82%	7
	0069 000	Cod, haddock, hake, pollock, cusk, not skinned nor boned, containing not over 43% moisture by weight	0.5¢ lb.	4,363
	0069 900	Cod, haddock, hake, pollock, cusk, skinned or boned	1.25¢ lb.	2,125
	0070 400	Herring, bulk or in containers weighing with contents over 15 pounds each and containing each over 10 pounds of herring, net weight	0.25¢ lb.	3,688
720		Smoked or kippered:		
	0075 100	Herring, whole or beheaded, hard dry-smoked	5¢ lb.	152
	0075 300	Herring, boned	1.25¢ lb.	199
	0075 400	Herring, eviscerated, split skinned or divided into portions	1.25¢ lb.	105
	0075 600	Cod, haddock, hake, pollock, cusk, filletted, skinned, boned, sliced or divided	1.5¢ lb.	680

1/Less than \$500.00.

(Continued on the following page.)

International (Contd.):

Import Tariff Par.	SCHEDULE A Sta. Class. (1959)	Brief Description	Duty July 1, 1958	U. S. Imports 1959 US\$1,000
721(b)	0081 500	Clams other than razor clams and clams in combination with other substances (except clam chowder) in airtight containers		
721(c)	0078 500	Fish paste and fish sauce	20% ^{2/}	753
721(d)	0079 590	Caviar and other fish roe, except sturgeon, boiled and packed in airtight containers	10%	68
775	1250 210	Soups, soup rolls, soup tablets or cubes, etc.	7 $\frac{1}{2}$ %	658
	(part) 1250 250	Pastes, balls, puddings, hash and similar mixtures of vegetables, meat, or fish, n.s.p.f.	17 $\frac{1}{2}$ %	
1519(a)	0737 600	Fur sealskins, dressed	21%	14
	0737 620	Fur sealskins, dressed and dyed	12 $\frac{1}{2}$ %	36
1528	5953 500	Pearls and parts, not strung or set	15%	24
		Natural	5%	595
1530(c)	5953 900	Cultured or cultivated	5%	13,083
	0334 000	Reptilian and shark skin leather		
1538	0334 100	Upper for shoe purposes	10%	1,364
	0990 290	Other	15%	164
1540	2950 080	Shells and mother-of-pearl, engraved, cut, ornamented or manufactured	15%	332
1558	(part) 2260 240	Moss and sea grass, eel grass, and seaweed, dyed or manufactured, n.s.p.f.	5%	519
	1190 800	Fatty acids, n.s.p.f., derived from vegetable oils, animal or fish oils, or animal fats or greases (except from linseed oil)	10%	60
1669	2210 980	Dogfood, unfit for human consumption	10%	939
		Drugs of animal origin, not edible, crude, n.e.s.; Fish oils, n.e.s. (except cod, herring, and dogfish oil) and fish-liver oils, n.e.s. (except cod-liver, halibut-liver, shark-liver and dogfish-liver oils)	Free plus 1.25¢ lb.	-
1681	0723 500	Seal furs and fur skins, undressed	Free	190
1722	2950 080	Seaweeds not further manufactured than ground, powdered, or granulated	Free	-

^{2/}Based on American selling price.

Salmon, frozen, cured or canned
Sardines or pilchards, canned
Mackerel, canned
Oysters, fresh, frozen or canned
Shrimp, fresh, frozen or canned
Fish oils and fats
Fish-liver oils
Fish meal and solubles
Vitamins and viosterols, medicinal fish oils and fish-liver oils and concentrates, including vitamin A and cod-liver oil.
Pearl essence

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

ARTIFICIAL SPAWNING AREA FOR SALMON DEVELOPED:

A new development in the study of artificial measures for producing salmon is being undertaken by the International Pacific Salmon Fisheries Commission. An artificial spawning channel 3,000 feet long and 20 feet wide is now being constructed by the Commission adjacent to Seton Creek near Lillooet, British Columbia. The channel is

expected to substitute for pink salmon spawning areas flooded out by a power company's diversion dam constructed in 1960 on Seton Creek. Land for the project has been made available by the power company. It is estimated that a minimum of 10,000 pink salmon can spawn successfully in the area with at least double the rate of production from spawning in the natural stream below the power dam.

Operations of the Seton Creek spawning channel will be carefully controlled and recorded as to cost and efficiency that comparisons can be made with the operations of the new Pitt River experimental hatchery scheduled for completion in August of this year.

Experimental spawning areas under investigation by the Canadian Department of Fisheries and the Commission since 1953 have proven to be very effective in increasing salmon fry production and the cost of operation appears to be considerably less than for the standard type hatchery.

International (Contd.):

OCEANOGRAPHY

TO BE ABLE TO FORECAST BEST FISHING AREAS IS AIM OF EUROPEAN OCEANOGRAPHIC-DATA GATHERING SURVEY:

Two marine research vessels sailed from Aberdeen, Scotland, early in June 1960 bound for the Faroes for a week-end rendezvous with seven similar vessels for an international sea science expedition. The expedition is to survey the two-hundred-or-so mile wide submarine ridge between Faroe Islands and Iceland.

Leader of the expedition is head of the hydrographic section of the Marine Laboratory, Torry, Aberdeen. He sailed on the Laboratory's research vessel, Explorer, which was accompanied from Aberdeen by the Royal Research ship Discovery II.

A three-week "top to bottom survey" was planned of the sea ridge by scientists and oceanographers aboard the international fleet of nine research vessels from Russia, Iceland, Norway, Germany, England, and Scotland.

This is the biggest effort of its kind to be staged in the interests of commercial fisheries from a scientific perspective.

The hydrographers and oceanographers will measure the surface, mid-water, and bottom currents as well as internal waves flowing over the ridge, which is a natural barrier between the Arctic and Atlantic oceans.

They will gather samples of the flora and fauna in the overspill and try to photograph the sea bottom, which is 8,528 feet at the deepest point.

The survey is important to all European fishing nations because the cold heavy water on the ridge is believed to have great effects on sea fishing in Northwest Europe.

The scientists will also measure the cold water overspill to test the theory that cold-water currents undermine the warmer waters of the Atlantic, pushing the warmer water nearer to the surface

and the fish food and consequently the fish with it.

If the theory about the effect of cold currents is correct, it may be possible for the "experts" to forecast as much as three years ahead where the best fishing will be.

"We hope to be able to get closer to the answer of the problematical fluctuation of fish breeding," said the leader of the expedition.

The expedition, which took many months to prepare, is a corollary of the polar front survey investigations of the International Geophysical Year. (The Fishing News, June 3, 1960.)

TERRITORIAL WATERS

BRITISH-NORWEGIAN TALKS MAY YIELD COMPROMISE ON FISHING LIMITS:

It was learned in Oslo on May 29, 1960, that the possibility of a "six plus six" (six miles territorial waters and an additional six miles for exclusive fishing limits) agreement among the Atlantic nations was raised during the Anglo-Norwegian discussions on fishing limits. Foreign trawlers might, however, be allowed to fish within the outer six-mile belt during a ten-year transition period.

This agreement, it is felt, would represent a compromise between the clashing Norwegian inshore and deep-sea fishing interests. It would also be in line with the Anglo-Danish arrangement for the Faroe Islands.

The exploratory discussions which took place between British and Norwegian representatives was followed by an official communique which merely stated that there had been "a free and frank exchange of opinions." It added that there was hope of further talks at a later date.

Norway's intention to extend her fishing limits from 4 to 12 miles had been known by the British Government for a long time, and it became a reality after the failure of the recent Law of the Sea Conference at Geneva.

It means that Britain is now faced with getting a settlement with Norway as well as ending the dispute with Iceland.

International (Contd.):

Neither Norway nor Iceland is in a position to act promptly, and in Norway the industry is divided on the subject. The distant-water trawling faction in Norway is against the proposal because it is facing increasing prohibitions in foreign grounds. It is the inshore industry, mostly confined to the north, which is demanding a 12-mile limit to preserve its grounds from "foreign invasions." (The Fishing News, June 3, 1960.)



Angola

FISH OIL EXPORTS:

In 1959, Angola's exports of fish oil were estimated at 8,000 metric tons as compared with 8,500 tons in 1958. Most exports were to West Germany. From year to year Angola's stocks of fish oil are only a few hundred tons. (U. S. Foreign Agricultural Service Report, Leopoldville, April 15, 1960.)



Austria

MARINE OIL IMPORTS, 1958 AND 1959:

Total Austrian imports of nonedible marine oils decreased from 769.8 metric tons in 1958 to 551.0 metric tons in 1959. No marine oils were imported from the United States in either 1958 or 1959. (U. S. Foreign Agricultural Service report, Vienna, April 14, 1960.)

Austria's Imports of Nonedible Marine Oils, 1958 and 1959		
Country of Origin	1959	1958
	(Metric Tons)	
West Germany	183.9	159.2
Netherlands	98.4	6.7
Norway	248.0	544.2
Sweden	15.3	40.5
Others	5.4	19.2
Total	551.0	769.8

Marine oils, crude and refined in units of more than one liter, under Austrian Import Customs Tariff Code 15.04 B can be imported free of duty. Liberalization of imports of fats and oils from the dollar area extends to all duty-free items. Thus, the nonexistent imports

from the dollar area are not the result of Government restrictions.



Belgium-Luxembourg

MARINE-OIL IMPORTS AND EXPORTS, 1958 and 1959:

In 1959, Belgium-Luxembourg imported 17,906 metric tons of raw and refined marine oils--down about 2.3 per cent from 1958. These exports came principally from Japan (8,713 metric tons in 1959 and 10,390 tons in 1958) and from the Netherlands (4,594 tons in 1959 and 3,959 tons in 1958).

Exports, on the other hand, amounted to 783 tons in 1959 and 587 tons in 1958, shipped mainly to the Netherlands, Western Germany, and France. (U. S. Foreign Agricultural Service Report, Brussels, April 27, 1960.)



Brazil

FISHING INDUSTRY IN STATE OF SAO PAULO DEVELOPING RAPIDLY:

The Santos Fish Depot, constructed and owned by the Brazilian Government, has been operating on a commercial scale since September 1959, producing 100 metric tons of ice daily and storing up to 450 tons of fish. The Sao Paulo State Government in May 1960 was taking steps to purchase the depot from the Federal Government in 1961 (lease expires March 1961). The decision to purchase the depot indicates the interest of the State Government in developing fishing operations off the coast of Sao Paulo and increasing existing storage capacity. In this respect, the Santos Fish Depot is an important link in the chain of ice-making and fish-storage facilities which are being put up by the Sao Paulo State Government along the coast.

At Ubatuba, a fish depot with capacity to produce 10 tons of ice daily and store up to 10 tons of fish is already operating. At Sao Sebastiao, a depot (to be completed in 1961) is being built to produce 25 tons of ice daily and store 20 tons of fish. A few miles away, at Ilha Bela, an ice-making plant with capacity for 100 tons of ice daily, is under construction. South of Santos, at Itanhaem, is a small depot producing four tons of ice daily and storing up to 10 tons of fish, while further south along the coast, at Iguape and Registro, two twin depots, each to produce four tons of ice daily and accommodate up to 10 tons of fish, were due to go into operation in June. In addition, when construction of the projected Centro de Abastecimento (Supply Center) near Sao Paulo is completed in 1962, facilities for making 100 tons of ice daily and storing up to 5,000 tons of fish will then become available.

In 1959 the State Government established the fishery biology service at Santos to study aquatic animals. A research staff from the Oceanographic Institute, the University of Sao Paulo, and the Secretariat of Agriculture, with the assistance of a technician from the Food and Agriculture Organization (FAO), set up a laboratory in the Santos Fish De-

Brazil (Contd.):

pot and are looking into the abundance of fish and classifying the species in Brazilian waters, the effect of fishing on natural stocks to determine the most effective methods of fishing without endangering the supply, and charting and plotting of currents and tides.

Of importance to the local canning industry is the research work carried out jointly by the Sao Paulo and Federal Governments on the canning of "manjuba" (sand smelts) at a pilot plant at Registro.

The Sao Paulo State Government is concerned about the primitive methods of commercial deep-sea fishing off the State coast. Aside from the Japanese-owned fishery company that operates modern trawlers and fishing equipment, practically all fishermen work on vessels 20 or more years old, and use obsolete and primitive gear. In an effort to renew the existing fishing fleets and render their operation more effective, the State Government is considering financing the purchase of modern vessels and equipment, at a total outlay of 300 million cruzeiros (about US\$1.6 million), the United States Consul at Sao Paulo reported on May 31, 1960.



Canada

MARINE OIL PRODUCTION,
FOREIGN TRADE, AND
CONSUMPTION, 1959:

Production: Marine-oil production in Canada from 1957-1959 increased steadily—3.8 million Imperial gallons in 1957; 5.5 million gallons in 1958; 6.0 million gallons in 1959. Herring oil on the west coast and cod oil on the east coast were responsible for the increase in output from 1957 to 1959.

Indications are that marine-oil production in 1960 will be lower due to the tie-up of Canada's west coast herring fishing fleet because of low ex-vessel prices.

Early in 1960, storage facilities for byproducts were taxed to the limit. This, plus low-priced competition from Peru, forced closure of the herring fishery after Christmas 1959.

Table 1 - Canada's Production of Marine Oils, 1957-1959

Type	1959	1958	1957
.... (Imperial Gallons 1/)			
Atlantic:			
Cod oil	845,323	620,224	823,323
Herring oil	n.a.	n.a.	107,900
Other (seal, etc.)	453,996	785,185	712,843
Total	1,299,319	1,405,409	1,644,066
British Columbia:			
Herring oil	4,746,304	4,127,761	2,180,510
Canada Total	6,045,623	5,533,170	3,824,576
n.a. - Not available.			
1/One Imperial gallon equals 1.2009 United States gallons.			

Exports: Canadian marine oils have enjoyed an export boom over the past three years—climbing from 0.8 million Imperial gallons in 1957, to 1.6 million gallons in 1958, to a new peak of 3.7 million gallons in 1959. Decreasing demand at home has caused Canadian marine oils to seek foreign markets.

In 1957 the United States was the principal buyer of Canada's marine oils. But in 1958 and 1959 the United States has received a smaller proportion of Canada's marine-oil exports each year. Importation of cod-liver oil is the exception since exports of that product to the United States have increased steadily.

Table 2 - Canada's Exports of Marine Oils by Type and Country of Destination, 1957-1959

Type and Destination	1959	1958	1957
..... (Imperial Gallons)			
Cod-liver oil,			
pharmaceutical,			
crude and sun rotted:			
United Kingdom	103,706	96,974	29,425
United States	675,456	443,893	571,585
Other Countries	270	-	540
Total	779,432	540,867	601,550
Herring oil, industrial:			
United Kingdom	2,217,372	298,666	-
Netherlands	-	277,733	-
United States	58,769	-	20,100
West Germany	146,975	162,837	-
Total	2,423,116	739,236	20,100
Whale oil:			
United Kingdom	189,817	262,888	-
Netherlands	98,137	-	-
France	-	-	720
United States	66,020	87,290	193,312
El Salvador	84,870	-	-
West Germany	60,600	-	-
Total	499,444	350,178	194,032
Fish oils, other:			
Alaska	-	400	63
United States	511	4,676	33,347
Other Countries	8	2	7
Total	519	5,078	33,417
Canada Total	3,702,511	1,635,359	849,099
Total marine-oil exports to United States & Alaska ..	800,756	536,259	818,407

Imports: Canadian marine-oil imports continue to fluctuate. Imports amounted to 0.4 million Imperial gallons in 1957, increased to 1.4 million gallons in 1958, and fell sharply to 0.7 gallons in 1959.

Some cod-liver oil imported by Canada came from the United States, but those imports dropped from 537 gallons in 1957, to 11 gallons in 1958, and to an insignificant amount in 1959. The United Kingdom was Canada's principal supplier of cod-liver oil during the 1957-59 period.

Imports of whale and sperm oil from the United States have steadily increased from 1,118 gallons in 1957, to 10,119 gallons in 1958, and to 19,783 gallons in 1959. On the other hand, both the United Kingdom and Norway have been shipping less whale and sperm oil to Canada. The bulk of the other fish oils were imported from the United States.

Consumption: Marine oils in Canada are used principally in margarine and shortening. But this type of use in 1959 hit a six-year low (table 4). The use of substitutes for ma-

Canada (Contd.):

Type and Origin	1959	1958	1957
..... (Imperial Gallons).....			
Cod-liver oil:			
United Kingdom	218,698	225,883	96,454
Iceland	-	1,087	-
Norway	7,355	4,100	25,040
Netherlands	3,074	-	-
United States	-	11	537
Total cod-liver oil ...	229,127	231,081	122,031
Fish oil, unclassified:			
Japan	18,267	25,178	21,311
Norway	758	9,570	-
United States	379,852	1,375,162	280,563
Total unclassified ...	398,877	1,409,910	301,874
Whale & sperm oil:			
United Kingdom	4,223	7,169	8,203
Norway	7,058	3,857	15,176
United States	19,783	10,199	1,118
Total whale & sperm oil	31,064	21,225	24,497
Total all marine oils ...	659,008	1,662,216	448,402
Total United States ...	399,635	1,385,372	282,218

rine oils in the production of margarine and shortening is mainly responsible for this decline. In margarine production, soybean and cottonseed oil as well as lard are displacing marine oil, while in the making of shortening, animal fats now predominate.

Smaller quantities are used in paints, varnishes, and lacquers—327,000 pounds in 1956 and 368,000 pounds in 1957. Still smaller quantities are used in the soap and washing compounds industry—8,355 pounds in 1957. (Data on use in paint and soap industries for 1958 and 1959 not available to date.)

	1959	1958	1957
..... (1,000 Lbs.).....			
Margarinet			
Production	152,472	145,607	130,645
Marine oils used	12,776	19,806	17,070
Percent	8.3	13.6	13.0
Shortening:			
Production	160,077	163,288	152,047
Marine oils used	5,061	16,741	26,377
Percent	3.1	10.2	17.3

* * * * *

ONTARIO FISH LANDINGS DOWN SHARPLY FIRST QUARTER OF 1960:

The preliminary estimate of commercial fish production for the first quarter of 1960, by the Ontario Department of Lands and Forests, shows 827,000 pounds reported for the Province with a value to

the fishermen of C\$115,000. This represents a decrease of 71 percent from the 2,891,000 pounds reported for the first quarter of 1959.

The drop in Lake Erie commercial landings, resulting from a late start in March, accounted almost entirely for this decrease. Production of all species was down from 1,994,000 pounds for the first three months of 1959 to 177,000 pounds worth C\$23,000 for the first quarter of this year. Perch was down from 1,247,000 pounds to 94,000 pounds; white bass from 283,000 pounds to 4,000 pounds; sheephead, from 178,000 pounds to 8,000 pounds; and yellow pickerel from 183,000 pounds to less than 1,000 pounds. Smelt production increased slightly to 71,000 pounds.

Not included in the January-March 1960 production of commercially-licensed fishery operations, experimental trawling gear operated by the commercial fishermen landed an additional 547,000 pounds of smelt from Lake Erie.

Production reported for the northern inland waters dropped 6 percent to 423,000 pounds valued at C\$50,000 to the fisherman. Yellow pickerel was down from 112,000 pounds to 94,000 pounds; whitefish from 70,000 pounds to 49,000 pounds; and northern pike from 103,000 pounds to 92,000 pounds.

Lake Ontario landings fell from 288,000 pounds to 116,000 pounds, valued at C\$23,000. Carp dropped 77 percent to 48,000 pounds; and whitefish decreased from 24,000 pounds to 13,000 pounds. Yellow pickerel landings gained slightly to 27,000 pounds.

In Lake Superior over-all production decreased nearly 50 percent to 47,000 pounds. Of this 31,000 pounds was herring; 8,000 pounds yellow pickerel; and less than 1,000 pounds lake trout.

Production in other areas was: Southern inland waters 35,000 pounds; North Channel 13,000 pounds, and Lake Huron 2,000 pounds; no production was reported for Georgian Bay, the United States Consul in Toronto reported on June 21, 1960.

* * * * *

Canada (Contd.):

**PROGRESS IN OYSTER
REHABILITATION ON EAST COAST:**

With regard to the problems which have beset the oyster industry in the Maritime Provinces of Canada, in particular the epidemic disease which by the end of 1958 had ravaged almost all the main oyster areas in New Brunswick and Nova Scotia, good progress was reported at the final session of the Federal-Provincial Atlantic Fisheries Committee, early in May 1960 in Ottawa.

In 1959, test lots of oysters indicated no further spread of the mortality.

The Canadian Department of Fisheries 1959 transplant of disease-resistant oysters from Prince Edward Island proceeded as planned. A total of 3,200 barrels of the disease-resistant oysters were transplanted in New Brunswick and Nova Scotia, and it is expected that the full program of transplanting 10,000 barrels will be completed this year. In all areas examined, the transplanted oysters suffered only normal mortality or less, and continuing good growth was demonstrated.

The Department is intensifying its efforts to develop a method of raising seed oysters to stabilize the industry. In this project, 40,000 cement-coated egg-case fillers were suspended in various Maritime areas. Growth was excellent, with a harvest of 600 barrels of oyster spat. In its seed-farming work a mechanical digger using an escalator principle, which had been tested for clams and modified for oyster work, was used successfully.



Ceylon

**JAPANESE ENGINEERS REPORT
ON FISHING PORTS:**

The team of Japanese harbor engineers who visited Ceylon in February 1960 at the request of the Government of Ceylon, has completed its report on the potential development of a network of small fishing ports in that country. The report is not yet available, but it is

understood that the locations recommended as feasible are: Mutual, Galle (east and west), Trincomalee, Jaffna, Kalpitiya, Negombo (two ports), Point Pedro, Mannar, Puttalam, Beruwela, Tangalle, Hambantota, Arippu, Batticalles, and Chilaw.

Much emphasis was laid on the development of the fishery industry in the Ten Year Plan which incorporated the recommendations of another Japanese team's report made in 1958. Construction of ports and shelters are a primary concomitant to the introduction of the large number of mechanized fishing craft recommended, but implementation will be slow because of financial limitations. (United States Embassy, Colombo, June 3, 1960.)



Chile

**FISHING INDUSTRY GRANTED
SPECIAL CONCESSIONS:**

The Chilean President (Decree Law No. 266 of March 31, 1960) authorized special concessions and exemptions for individuals or companies engaged in any phase of the fishery industries. The decree law was published in *Diario Oficial* 24,613, April 6, 1960, and became effective with publication. Concessions and exemptions granted under this decree-law may not extend beyond December 31, 1973.

The decree law applies only to those legal entities or individuals exclusively engaged in one or more of the following: (1) extraction, fishing or hunting of marine resources; (2) freezing, conservation, elaboration or transformation of marine resources; (3) construction or repair of industrial or commercial fishing boats.

Time devoted to construction and manufacture of equipment, accessories, and materials for own use will be considered as within these activities.

Concessions and exemptions authorized to entities or individuals engaged in one or more of those activities are:

(1) A 90-percent reduction in taxes on profits and earnings including dividends distributed to stockholders or partners. Personal Tax (*Global Complementario*) or additional tax on such income will be reduced to one-tenth, i.e. by 90 percent.

(2) A 90-percent reduction in real estate tax and all taxes, contributions, surcharges, duties or charges levied on land, buildings, constructions, installations, and expansions destined for the direct use of one or more of such activities. The same concession is applicable to construction contracts, approval of plans, and to permits relative to those activities, and to rental, grant, or use of

Chile (Contd.):

state land, beaches, shore land, and water area or sea floor.

(3) Exemption from all taxes effecting distribution, sale, or purchase of: (a) fresh, frozen or canned fish, whales, shellfish, crustaceans, and other marine resources except oysters, lobsters, crabs, and sea urchins; (b) fish meal, whale meat and bones, and fish oil.

(4) Exemption from tax established by Law No. 12,120^{1/} of purchase contracts covering the following: marine motors and cargo hoists; fuel and lube oils; machinery, spare parts and accessories; cold-storage plant equipment and machinery, spare parts and accessories; freon gas; cold-storage units for exhibition and sale of seafoods; tin plate and containers; sheets and other steel products for use in construction or repair of fishing boats; nets, string, sisal or other ropes; cables, flexible or rigid, galvanized or not; and navigation and fishing equipment.

(5) Exemption from "cifra de negocios" tax (sales tax) on contracts covering construction, repair, and rental of fishing boats, manufacture of containers for fish products, and water and electric power for specified industrial activities.

(6) Exemption of seal and stamp tax on public deeds relative to formation, modification, reorganization, capital increase or expansion of companies engaged or to engage in one or more of the specified activities related to the fisheries industry.

(7) To classify as a capital increase rather than income differences in value derived from damage fire and indemnization in cases of shipwreck, disaster, or other risks, loss, abandonment, boarding of ship, salvage, or through transfer of goods, provided such funds are invested within three years in renovation, repair, or expansion of the industry.

(8) Exemption of fishing boats from cabotage fees and taxes, lighthouse and buoy contributions, and other maritime fees applicable to them. Fishing products and boats will be granted special tariffs which will be no more than 50 percent of existing rates on port charges, docking, use of wharves, freezing plants, radio equipment, and naval aids.

(9) Profits withdrawn from a business subject to third or fourth category income tax (Clause 12, Article 48 b of Income Tax Law) and invested in one or more of the specified fisheries activities may be excluded for the purpose of Personal Income or Additional Tax. However, should these funds be withdrawn before five years from date of capitalization they will become subject to tax.

(10) Exemption from import duties, statistics, ad valorem, storage, and all taxes and charges and consular fees and any other contribution, deposit or guarantee on the following imports: fishing boats of over 10 tons; machinery for exclusive use of fisheries industry; nets; completely equipped refrigerators; boats, cars or trucks; ma-

chine motors and winches; and equipment parts and accessories for fisheries industry.

(11) The same exemptions will be granted the following imported products if authorized by the Foreign Exchange Commission on basis of a recommendation from the Direccion General de Produccion Agraria y Pesquera and a statement from the Ministry of Economy which certifies that the merchandise is not produced in the country in adequate quantity, and quality at reasonable prices; all types of petroleum, combustibles and lubricants for fisheries industry; equipment, machinery, and units for freezing plants, parts, and accessories; special refrigerator equipment, machines, and units for exhibition and sale of frozen seafoods; tin plate with protective varnish coating, printed or not, for use in export of fish products; tackle, strings, and ropes of natural or synthetic fiber, cables, flexible and rigid, galvanized or not; and navigation and fishing aids.

To enjoy the concessions and exemptions authorized by Decree Law No. 266, companies or individuals must register in the "Rol de Industrias Pesqueras, Anexas y Complementarias" maintained by the Direccion de Produccion Agraria y Pesquera, Ministry of Agriculture. Conditions and requirements for registration will be established by Regulation.

Such companies or individuals for the first 10 years must capitalize no less than 75 percent of profits by investment in development of said industry, financing other related activities, or construction of workers' housing. The ten-year period will begin with the first fiscal year following the granting of the privileges, and the form and conditions by which this requirement must be carried out will be established by Regulation.

The decree granting the privileges authorized by Decree Law No. 266 to an individual or company will be made a public deed and will include the capitalization program and modus operandi for the investment referred to above.

Fishermen's cooperatives, with recommendation of Direccion General de Produccion Agraria y Pesquera and the Departamento de Cooperativas de Ministerio de Economia may be granted the privileges authorized by this decree even though not dedicated to the lines of business specified, provided the members are engaged in these activities.

Machinery, equipment, and materials imported free of duty and other charges or under contracts exempt from tax established by Law 12,120 may not be sold or transferred as to domain, use, possession or simple holding without prior authorization of the Direccion General de Produccion Agraria y Pesquera. Finished products, to be defined by regulation, may be sold without prior authorization.

The President may revoke at any time the decree granting these privileges if, in his judgement, any act may have been executed which constituted an infraction of the 10-year capitalization program, sale or transfer of machinery equipment and materials, or one or more of the requisites specified. Companies or individuals so affected must pay all taxes, duties, surcharges, contributions and other

^{1/}Law 12, 120 of September 7, 1956, published *Diario Oficial* 23,586 of October 30, 1956, established a tax on purchase sale and barter exchange of certain products. The amount of the tax varies with the various articles specified in the law.

Chile (Contd.):

charges from the date on which the exemptions were in force, without prejudice to the sections that might be applied.

Decree Law No. 266 met with general approval and is considered by the industry to give fisheries operations in Chile a new lease on life. The concessions and tax exemptions granted by the Decree Law, together with the loan program announced by Corporacion de Fomento de la Produccion will enable the various phases of the industry to round out its organization to permit profitable commercial operations. Capital has been spread thin in most of the industry and the fleet, particularly, is inadequate to support industrial plants. The 13-year period of tax relief will permit the companies and individuals to weather the off-years and build up their working capital, the United States Embassy in Santiago, reported on June 11, 1960.

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INCREASED FISH-MEAL PRODUCTION BOOSTS EXPORTS:

In 1959 Chilean fish-meal production increased by 1,692 metric tons. Production in 1958 was 20,200 tons as compared with 18,508 tons in 1958.

Item	1959	1958	1957
 (Metric Tons)		
Production	20,200	18,508	16,260
Exports	7,000	4,640	4,506
Domestic consumption	13,200	13,868	8,013

A United States company has brought three fishing vessels to Chile to conduct a training program for fishing captains in new methods used in locating and catching fish. The United States Operation Mission in Chile is participating. The President of the company has one of the boats fishing and its catches have been satisfactory in spite of bad weather. The training program was expected to get under way shortly.

Chile has 29 fish-meal plants, none of which have an adequate supply of raw fish to maintain plant production at a third of plant capacity. (U. S. Foreign Agricultural Service Report of April 25, 1960, and United States Embassy report of May 20 from Santiago.)



Ecuador

IMPORTS AND CONSUMPTION OF MARINE-ANIMAL OILS:

Imports: Imports of marine-animal oils into Ecuador rose sharply from 1957 to 1958, but declined rapidly in 1959. Decreased amounts of liver-oil imports from Norway in 1959 were mainly responsible for the decline. Liver-oil imports alone, from the United States, followed the same pattern, increasing in 1958 and dropping off in 1959.

It is expected that total imports of fish oil, including body and liver oil, should increase to 35,274 pounds in 1960. An increase in total sperm-whale oil imports is also anticipated--from 368 pounds in 1959 to 882 pounds in 1960.

Table 1 - Ecuador's Imports of Marine-Animal Oils by Country of Origin, 1957-1959

Commodity and Country	1959 ^{1/}		1958 ^{2/}		1957 ^{3/}	
	Pounds	US\$	Pounds	US\$	Pounds	US\$
Cod- or Shark-Liver Oil:						
United States	1,675	1,017	4,015	566	3,137	1,627
United Kingdom	2,125	507	3,999	681	12,826	2,595
West Germany	672	128	220	35	220	37
Norway	25,146	3,768	62,214	9,051	37,771	5,877
Costa Rica	-	-	2	3	-	-
Italy	7	4	-	-	-	-
Total	29,625	5,424	70,450	2/10,336	53,954	3/10,136
Sperm-Whale Oil:						
West Germany	132	44	1,113	376	496	197
United States	236	73	201	102	-	-
Total	368	117	1,314	478	496	197
Total All Oils	29,993	5,541	71,764	10,814	54,450	10,333

1/Revised.

2/Preliminary.

3/Includes body and liver oil.

Note: Values converted at rate of 15.00 sucres equal US\$1.

Because of a decreased demand at home (13,868 tons were consumed in 1958 as against only 13,200 tons in 1959), the excess production was exported. Exports in 1959 increased 2,366 metric tons--from 4,640 tons in 1958 to 7,000 tons in 1959. Exports for calendar year 1958 to the United States (the best customer for Chile's fish meal) were 2,101 tons, while during the first eight months of 1959 exports totaled 2,193 tons. This means that total 1959 exports to the United States will be considerably greater than 1958. Exports to West Germany totaled 1,508 tons in 1958 as compared to 1,757 tons for only the first eight months of 1959. Holland in 1959 also became an important outlet for Chilean fish meal.

Consumption: The consumption of fish oil (about 51,000 pounds in 1959), including body and liver oil, in Ecuador is maintaining a fairly steady level, with a maximum fluctuation of about 4,000 pounds during the period 1958 through 1960. Sperm-whale oil consumption decreased from 1958 to 1959, but a partial recovery is anticipated in 1960. (U. S. Foreign

Ecuador (Contd.):

Species	1960 ^{1/}	1959 ^{2/}	1958 ^{3/}
	(Pounds)		
Fish oil ^{4/}	48,501	50,706	46,297
Sperm whale oil	882	441	1,433
Total	50,706	51,147	47,730

1/Forecast
2/Preliminary
3/Revised
4/Includes body and liver oil.

Agricultural Service Report, Quito, April 19, 1960.)



French West Africa

TUNA FISHING SEASON 1959/60 ENDS WITH RECORD LANDINGS:

The French West African (Senegal) 1959/60 albacore tuna fishing season, which began on November 1, 1959, closed on April 30, 1960, with record landings of 17,500 metric tons. This amount exceeded the goal of 16,000 tons by about 9.4 percent. During the season 57 tuna clippers participated in the fishery.

The tuna landings were utilized as follows: 6,500 tons were canned for export to the French market; 3,000 tons were sold for export to a large United States west coast tuna canner; 3,000 tons were sold to Italy; and the balance of 5,000 tons are due to be shipped to France for processing.

Despite the good season, the Dakar canneries were not in a very favorable world competitive position, as can be seen by the fact that France had agreed to purchase 750 additional tons of canned tuna if the canneries were able to sell another 750 tons for export elsewhere above commitments already made, which they were unable to do. An official in the Fisheries Division of the Senegalese Ministry of Rural Economy stated that there are several factors which account for this. The most important is the high operating cost of the canneries. Other factors are the cost of electricity, which is 8 times as much as in France; relatively low productivity; labor, which is paid higher wages than similar Japanese and Spanish workers in fish canning; European supervisors and technicians, who are paid high salaries, and are needed to run the canneries; most of the processing equipment must be imported; and the use of relatively high-priced locally-produced peanut oil. Other considerations are high freezing costs, and high storage and transportation fees.

The Government and private industry have been drawing up plans to lower the high canned tuna production costs by such things as the "California" type factory. The newly-created Fisheries Council had its inaugural meeting on April 29, 1960, and discussed the 1960 tuna campaign, the creation of a company to study the construction of a large capacity cannery, the utilization of the port freezing facilities, and the fish trade in general. The Council also decided to create a Commission to deal with fiscal matters relating to fisheries, trawling, tuna markets, improved native fishing equipment, the creation of a School of Fisheries, and the commercialization of locally-canned products.

The rapid growth of the tuna industry in Dakar is reflected by the annual tonnage increase. In the 1954/55 season only 400 tons were landed. This amount increased to 1,400 tons in 1955/56, to 7,000 tons in 1956/57, 11,000 tons in 1957/58, 12,000 tons in 1958/59, and jumped sharply to a total of 17,500 tons for the past season.

The number of tuna clippers rose from 5 in the 1954/55 season to the present figure of 57. However, it should be noted that the clippers were carefully chosen for the task before being permitted to start in the fishery. This would account for the successful 1959/60 season despite unfavorable weather conditions. Also, the Senegalese Government reportedly made a great effort at restricting the number of boats coming here from France after the bad experience of the 1957/58 season. At that time, over 90 clippers came and flooded the French market with tuna, and much could not be sold.

The price of whole tuna rose from about US\$128.64 per short ton to about US\$169.10 a ton landed in Dakar during the 1959/60 season. However, the top price of \$213.20 a ton was reached in the 1957/58 season, the United States Consulate in Dakar reported on May 12, 1960.



German Federal Republic

FISH-MEAL PRODUCTION UP DESPITE HEAVY IMPORTS:

West Germany's production of fish meal increased 13,000 metric tons in 1959. Production of fish meal (made mostly from sand lance) was up 11,000 tons and herring meal up 3,000 tons. Cod meal, however, was down 1,000 tons.

In 1959, sea and coastal waters yielded 156,000 tons of fish as raw material to 22 plants for the production of fish meal and oil--43,500 tons more than in 1958. Sand lance ("sanspirling") and herring comprised the bulk of the raw material. Whole fish, however, accounted for only 37 percent of the raw material in 1959; fish waste was the principal source of supply for fish-meal factories. Sand-lance production (caught only for reduction purposes) rose from 52,621 tons in 1958 to 58,842 tons in 1959. Since the sand-

Table 1 - German Federal Republic^{1/} Fish Meal Production, Type and Quantity, 1958-1959

Type	Quantity	
	1959	1958
	(1,000 Metric Tons)	
Cod meal ^{2/}	15	16
Herring meal ^{2/}	21	18
Fish meal ^{2/}	53	42
Other meal ^{2/}	4	4
Total	93	80

^{1/}Including West Berlin; Saarland included since July 1959.
^{2/}Requirements

	Minimum (%)			Maximum (%)		
	Protein	Ca	Phosphate	Fat	Salt	
Cod meal	60	8	8	12	8	
Herring meal	55	8	12	8	8	
Fish meal	55	15	8	8	5	

^{3/}Including production from shrimp.

Table 2 - German Federal Republic Supply and Distribution of Fish Meal

	1959	1958
		(1,000 Metric Tons)
Stocks beginning of year	2	1
Production	93	80
Imports	156	133
Total supply	251	214
Exports ^{1/}	8	4
Domestic consumption	237	208
Stocks end of year	6	2

^{1/}Includes exports to Soviet Zone of Germany: 1959, 7,000 tons; 1958, 2,000 tons.

German Federal Republic (Contd.):

lance season occurs at the time when raw material from other sources is scarce, it helps to level off season fluctuations in the fish-meal industry.

In addition to fish meal, the same factories produced 19,002 tons of fish body and liver oils in 1958 and 24,325 tons in 1959.

During 1959 the fish-meal market was dominated by large and cheap imports from Peru; in fact, three-fifths of the imports were Peruvian. This abundant supply caused a sharp decline in prices which continued from May of 1959 into March 1960. (U. S. Foreign Agricultural Service Report of April 14, 1960, from Bonn.)

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KNOT FREE TRAWL NET IN PRODUCTION:

A firm in Bremerhaven, West Germany, has begun production of a knotless ocean fish trawl net. The Director of the German Institute for Gear Research in Hamburg had good experience with the trawl when it was tested on the research vessel Anton Dohrn during a trip to the Barents Sea.

The factory began its experiments in the manufacture of a knotless trawl in 1955. While the Japanese machinery for producing knotless gear has not been able to guarantee uniform mesh widths, the German firm has succeeded in mastering this problem. It adapted a machine now used for the manufacture of curtains, shirts, upholstery material, etc., to plait or braid threads together in the same manner as curtains to produce a knotless fish trawl in only three hours. The method already has been patented, according to the report in Fiskaren, a Norwegian fishery trade periodical, of June 8, 1960.



Guatemala

JAPANESE FISHING COMPANY TO TRAWL FOR SHRIMP IN JOINT VENTURE:

A Japanese fishing company is to trawl for shrimp in partnership with interests in Guatemala. The shrimp resources of Central America are said to be the world's richest, and Mexico to the north and Panama to the south are noted for their shrimp fisheries. In the past 2 or 3 years the shrimp resources

off these two countries have been declining, and the shrimp fishing vessels of the Central American coast are congregating on the east coast of Guatemala.

At present Guatemala does not have any large-scale fishery facilities, but it has been found that the coast around San Jose has possibilities as a rich shrimp ground. The Japanese company is sending the chief of its planning section to Guatemala to prepare for entering this promising fishery. The company will complete business arrangements by the beginning of the shrimp fishing season in November and will send one of its trawlers for experimental fishing. Of the Japanese company's eight medium-size trawlers, two are oil-burning steamboats. These boats are unable to compete in the East China Sea grounds with modern Diesel boats, and the company sees the Guatemala venture as a way of using them. The company is planning on gross sales of about 800 million yen (US\$2.2 million) annually.

On the San Jose coast of Guatemala white shrimp are found in shallow waters, while brown shrimp are taken in waters about 20 fathoms deep. The shrimp are frozen and shipped to the United States. (The Suisan Keizai, May 22, 1960.)



Iceland

FISHERY TRENDS, 1959:

Landings: Icelandic fishery landings in 1959 for all species were considerably higher (up 11.8 percent) than in 1958—564,407 metric tons for 1959; 505,038 metric tons for 1958.

The rich ocean perch grounds which had yielded so much to the Icelandic fishing fleet earlier in 1959 began to fail as the year wore on. Lacking discoveries of new banks, the ocean perch catch during the last quarter of 1959 trailed off to 13,692 metric tons, compared with 46,664 tons for the same quarter of the preceding year. However, at the end of the year there was a revival in ocean perch fisheries when 6 or 7 Icelandic trawlers, following up on the findings of two West German trawlers, harvested good catches from new ocean perch beds off Newfoundland. Part of the decrease in the ocean perch fishery, however, was accounted for by a shift to the cod fishery. Record prices were received for landing iced fish, mostly cod, in Hull and Grimsby, England.

Although there was some increase in the amount of herring landed off the south coast, the quality of the herring was not up to that of the preceding year's. Contracts for salted south coast herring deliveries to Eastern Europe were not as great as for the preceding year. In September and October the herring catch was generally very poor and the quality low. Then in early November there was a large run of her-

Iceland (Contd.):

meal prices as a result of large exports of Peruvian and West African meal. There was a backup of Icelandic sales in the United States of frozen fish blocks and filets commencing in the fall of 1959. This has resulted in a smaller part of the frozen pack being prepared for the United States market.

Foreign Trade: The largest item in Icelandic exports to the Soviet Union consisted of frozen fish filets: in 1958 28,800 metric tons compared with 25,416 metric tons in 1959. The 1957-59 protocol of the Soviet Trade Agreement called for 32,000 metric tons of fish filets. Early in 1959 Icelandic exporters reduced this amount tentatively to 26,000 metric tons. The extraordinarily good catch led to subsequent efforts, partly successful, to have the amount under contract increased. The Soviet Union turned out to be by far the largest buyer of salted herring during 1959, taking 12,384 metric tons out of total exports amounting to 27,296 metric tons. Soviet purchases of salted herring were about the same as during 1958, 12,177 metric tons out of total exports of 30,523 metric tons. One of the principal declines registered in exports to East Germany was for salted herring. Whereas nearly 5,000 metric tons of salted herring had been exported to East Germany in 1958, only 778 metric tons were exported in 1959. The value of Polish imports of frozen fish filets in 1959 came to only a fifth of those in 1958, ring around the Westman Islands. However, this herring was not of high enough quality to use for salting. Part was used for bait; the greater part went for meal and oil production. The bulk of the fall herring catch occurred in December off the west coast of Iceland. A delay in salted herring deliveries to the Soviet Union ensued, not only due to the lateness of the herring season and a strike of the salters, but difficulties in getting laborers over the Christmas season. A relatively high proportion of the 1959 south coast herring catch went for freezing and reduction as compared with 1958. In spite of mounting stocks of herring meal and oil, a larger percentage of the catch went for meal and oil uses than in the 1958 period. There was also a considerable upswing in the amount of herring diverted to reduction during the north coast summer herring season, when 79 percent of the 1959 summer herring catch had gone for reduction as compared with only 44.1 percent in 1958.

Marketing: An interesting development during the last quarter of 1959 was the increase in landings of iced fish (largely cod) to the ports of Grimsby and Hull, England, despite difficulties closer to home with the so-called "cod war." During October only two trawlers discharged their catches of iced fish in Grimsby. A third, the *Hardbakur*, was called away when the Union of Dock Workers there refused to discharge the vessel because of antagonistic feeling. However, this labor union was overruled by the Labor Federation and the action was opposed by the British Trawler Owners, as contrary to the 1958 fish landing agreement with Iceland. Landings increased during the quarter and in several cases the Icelandic ships received almost twice as much per kilogram of landed fish in England as they received in Germany: ranged in December 1959 from 2.07 kronur to 3.02 kronur per metric ton (8-8.4 U. S. cents a pound) in Germany, whereas in England they received during the same month from 2.35 kronur to 4.64 kronur per kilogram (6.6-12.7 cents a pound).

The value of fish on ice exported (includes direct landings by Icelandic fishing vessels at British and German ports) from Iceland during 1959 was about 26 million Icelandic kronur (US\$1,698,040) as compared with 17 million Icelandic kronur (US\$1,046,000) for the year 1958. The value of Icelandic iced fish landings in Great Britain rose from 7.6 million Icelandic kronur (\$467,000) in 1958 to 10.6 million Icelandic kronur (\$652,000) during 1959 with the larger part sold in November and December 1959. Corresponding figures to West Germany were respectively 9.9 million and 15.8 million Icelandic kronur (\$609,000 and \$972,000).

Year-end carryover stocks of fish products amounted to some \$16.8 million in foreign exchange value. They were approximately 46 percent higher than at the end of 1958. This increase was largely made up of undisposed stocks of herring oil and meal. A large part of these 1959 stocks of oil and meal have now been sold, but large stocks of fish meal and oil are piling up again. The delay in meal sales was occasioned by a general world depression of herring

Growing consumption in the United States of Icelandic fish filet blocks and frozen filets played a large part in increasing exports. Last year's cut in the United States tariff on frozen fish blocks of almost 50 percent undoubtedly played a role in increasing these exports during the latter half of 1959. Exports of fish filets to the United States rose from 16,191 metric tons in 1958 to 21,727 metric tons in 1959, which is reported to be a record. On the other hand, the United States dropped off sharply as an importer of Icelandic salted herring having purchased 366 metric tons from Iceland in 1958, but only 22 metric tons in 1959. The value of United States imports of cod-liver oil rose from 3.5 million kronur (US\$215,250) in 1958 to 4.2 million kronur (\$251,500) in 1959. Exports to the United States of frozen shrimp and lobster rose from 2.5 million (\$153,800) in 1958 to 3 million kronur (\$184,500) in 1959.

Other exports to the United States included canned fish, fish roe, and salted cod.

Icelandic exports to West Germany dropped considerably. The main items of decline in exports to West Germany consisted of fish meal and herring and other fish oils, items prominent in the carryover. Exports of fish meal to West Germany dropped from 26.7 million kronur (\$1,642,000) in 1958 to 7.1 million kronur (\$436,000) in 1959, while ocean perch meal exports declined from 15.8 million (\$971,700) to 3.1 million kronur (\$190,700). (U. S. Embassy dispatch from Reykjavik, May 13, 1960.)

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FISHERIES TRENDS, MAY 1960:

The Icelandic winter cod-fishing season ended in mid-May and proved to be very favorable in all parts of the country.

The summer herring season was due to start at the end of May. On May 23, the management of the State herring factories and the Fishing Vessel Owners Association proposed to the Minister for Fisheries a price for herring for reduction of 110 kronur per 75 kilograms (about US\$35 a short ton at exchange rate of 38 kronur to US\$1). This price is 10 kronur under the 1959 price. The reduction in the price of herring for reduction is due to the drop in herring meal prices by 35 to 40 percent from last year. The new price for the raw fish is reportedly greater than the processors would obtain for the finished product on world markets today.

Sales of salted herring were good and advance orders total about 220,000 barrels. It is expected that the price for herring for salting will increase slightly over last year's.

What was expected to be a good lobster season also began in May off the south coast of Iceland.

The first two days of the whaling season started auspiciously May 23 and 24 with the landing of 13 whales.

Iceland (Contd.):

It was reported that the Norwegians engaged in seal hunting off the north-west coast of Iceland were earning good money. (U. S. Embassy in Reykjavik, May 27, 1960.)

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ICELANDIC FREEZING PLANTS CORPORATION HOLDS ANNUAL MEETING:

On May 25, 1960, the Icelandic Freezing Plants Corporation, which exports 80 percent of Iceland's frozen fish, convened its annual meeting. Proposals before the group highlighted export policy.

One of the most important of the 18 proposals was to use up to 2 percent of the "free on board" value of fish shipments for developing new markets, including advertising cost.

Another was related to the long-standing project to construct a storage and processing plant in the European Common Market area. This specifically called for approval to take a foreign loan of US\$400,000.

A third proposal sought authority for establishment of three research laboratories in coastal Icelandic towns. (U. S. Embassy in Reykjavik, May 27, 1960.)



Iran

SHRIMP TRAWLERS AT KARACHI FOR REPAIRS:

Seven 60-foot Iranian shrimp trawlers were reported hauled out at the Pakistani port of Karachi for repairs the latter part of May this year. These are shrimp trawlers that were purchased in 1959 and transported from the United States aboard freighters to the Persian Gulf to fish for shrimp for a firm controlled by a New York City importing and distributing firm. A freezership also makes up part of the fishing and freezing operation under the control of the United States firm.

The shrimp fishing and freezing fleet operates out of the Persian Gulf port of

Bandar Abbas, Iran. The shrimp fishing vessels, each with a three-man crew, reportedly landed 1,500 metric tons of shrimp in 1959. (United States Embassy in Karachi, May 26, 1960.)



Japan

EXPORTS OF MARINE PRODUCTS TO THE UNITED STATES, 1958 AND 1959:

During 1959, Japanese exports to the United States of all marine products (frozen and canned fish, marine oils, and miscellaneous items) of 127,289 metric tons were valued at US\$75.3 million, a decrease of 2.4 percent in quantity but an increase of 11.5 percent in value as compared with 1958. Frozen tuna exports (65,482 tons) to the United States in 1959 were valued at about US\$19.5 million, an increase of 5.3 percent in quantity and 2.7 percent in value over 1958. Exports of all marine products were higher in 1959 as compared with 1958, except for canned tuna and marine oils.

Japan's Exports of Marine Products to the United States, 1958 and 1959

Item	Quantity		Value	
	1959	1958	1959	1958
	.(Metric Tons) . .		.(US\$1,000) . .	
Tuna, frozen . . .	65,482	62,190	19,479	18,973
Tuna, canned . . .	9,905	13,727	10,493	11,754
Crabmeat, canned	3,114	2,547	7,542	5,816
Other canned . . .	29,549	19,590	23,839	15,644
Other fish and shellfish	17,578	16,465	12,053	9,391
Fish and marine animal oils	1,661	15,893	1,911	5,962
Total all marine products	127,289	130,412	75,317	67,540
Pearls, natural and cultured . .	-	-	11,759	9,047

In addition to the marine products mentioned, a substantial amount of natural and cultured pearls was shipped to the United States. (U. S. Embassy in Tokyo, May 13, 1960.)

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CANNED TUNA EXPORT PRICE NEGOTIATIONS STILL STALEMATED:

The directors of the Export Tuna Canners' Association in June 1960 were given full authority to negotiate with the trading companies on prices and sales methods. They met with trading company representatives on June 23 and at the meeting a spokesman for the pro-

Japan (Contd.):

ducers said that they would lower the price of white meat by 50 cents a case, but wanted to increase the price of light meat by 20 cents. The trading companies' representatives met to discuss this proposal on June 24, and the overwhelming consensus was that the packers' proposal is completely unreasonable under present circumstances.

They decided to continue to press for a \$1 cut in the white meat price and to maintain the light meat price at the present level. (The Suisan Tsushin, June 25, 1960.)

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EXPORT PRICE FOR YELLOWFIN TUNA UNCHANGED:

The Japan Frozen Foods Export Association and the Export Tuna Freezers' Association held a joint yellowfin tuna conference on June 20, 1960, to discuss the agreed price for July. They agreed to keep it at the same level as for the April-June period, with a base of US\$260 per short ton for 20- to 80-pound gilled and gutted clipper-frozen fish f.o.b. Japan, and so informed the joint sales company.

It was also decided that when a producer consigns fish to the joint sales company, designating the trading firm that is to handle it, and the designated trader does not make an export contract within 10 days, the joint sales company will be free to sell the fish to another trading company. (The Suisan Tsushin, June 21, 1960.)

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PRICE FOR FROZEN TUNA EXPORTS TO ITALY DROPS:

According to recent reports, the price in Japan for frozen tuna for export to Italy has been reduced to US\$270 a metric ton c. & f. for June to August only, but most of the Japanese trading companies claim that the new agreed price is still considerably above the actual market price, which is said to be about \$245-\$260 a ton. For this reason, all sales negotiations with the Italians were difficult. Informed sources point out that

sales conditions, which had continued good for two years, have completely changed this year. (The Suisan Tsushin, June 18, 1960.)

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FROZEN TUNA TO BE TRANSSHIPPED TO THE UNITED STATES FROM THE PACIFIC:

A large Japanese fishing company is to export about 800 tons of frozen tuna to the United States by transshipping it from the Fijian port of Suva. This is the first case of transshipment export from the Pacific.

The company's plan is to load about 600 tons of frozen albacore and yellowfin from the current Tenyo Maru mothership fleet operations, and about 200 tons of frozen skipjack from the land-based operations that began in May 1960 at Shamal Island in North Borneo, aboard the No. 28 Banshu Maru and send it directly to San Francisco and Astoria. The Japanese Fishery Agency's formal permission has already been secured, and the Banshu Maru was expected to arrive at Suva as early as the end of June.

The company hopes to make two or three similar transshipments in the future. If the practice becomes generalized, it is certain that other operators will make plans to transship to the United States the products of tuna motherships and tuna clippers through South Pacific islands or ports around the Indian Ocean (for example, Singapore).

The first transshipment through Suva will all come out of the Japanese operator's quotas for yellowfin and albacore exports from Japanese ports. (The Suisan Tsushin, June 27, 1960.)

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MORE FUNDS PROPOSED FOR U. S. TUNA MARKET SURVEY:

The Japan Export Trade Promotion Organization (JETPO) has at present a representative in Long Beach, Calif., to investigate and report on tuna fishing conditions, auction prices, etc. There are, however, many points that are not clear about trends in the United States, and there are a number of adverse con-

Japan (Contd.):

ditions in the frozen tuna export trade, so next year two more staff members will be stationed in the United States to study conditions in the fishery, auction prices, and the activities of canners.

Recently negotiations have been started with the Ministry of Agriculture and Forestry and other government agencies concerned for budget support for this increase, and the organization is seeking a doubling of government aid from the 37.7 million yen (US\$104,700) of the 1960 budget to 77.6 million yen (US\$215,000) next year.

Exports of frozen tuna to the United States in 1959 were about 72,754 short tons, an increase of about 48 percent from 1956. In particular, transshipment exports from the Atlantic Ocean have increased, but there have been many problems of claims in connection with these exports. (The Suisan Keizai, June 24, 1960.)

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SUMMER ALBACORE TUNA CATCHES DROP SHARPLY AFTER TYPHOONS:

The summer albacore fishery, which was having good fishing, has been almost brought to a halt by the effects of typhoons nos. 3 and 4, and the industry fears that the end of the season may come without any recovery. Great hopes had been held for this summer's fishery, because of the poor catches of the past two years. In mid-May the catches picked up, and through the first 10 days of June there were fairly substantial landings. The low water temperature zone on the south side of the Kuroshio was wider than in the average year, and the dense schools were extensively distributed around its outer boundary. However, after the passage of the typhoons the low temperature zone became even more greatly extended and the schools scattered, with the result that all of the good fishing areas disappeared.

According to reports from vessels at sea, there are few boats that are catching as much as 5 tons a set, and on the average they are getting only

about 1 ton from a school. Consequently the landings at Yaizu dropped off until they were only 91 metric tons on June 20, 79 tons on the 22nd, and 63 tons on the 23rd.

Summer albacore landings for the season through June 23 are estimated at around 13,000 or 14,000 tons, little more than 20 percent of the 60,000 tons required by canners and freezers. If the season ends as predicted, some sources feel that prices as high as those of last year will prevail. The ex-vessel price on June 20 was US\$353 a short ton, putting the price back up to about the same level as in May. (Suisan Keizai, June 24, 1960.)

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CARIBBEAN INVESTIGATION FINDS GREEN TUNA UNPREDICTABLE:

The findings of the Caribbean cruise of the Japanese Fishery Agency's research vessel Shoyo Maru have recently been compiled. The Agency reports, with regard to ways of dealing with the green meat problem in tuna, that in yellowfin the only correlation found was with the size of the fish. Above the weight of 88 pounds, there was found to be a danger of green meat occurrence. It was further reported that almost all big-eyed tuna had green meat.

The main points of the Shoyo Maru's report of research were as follows:

In processing of yellowfin ashore it is held that occurrence of green meat can be deduced from the color of the raw fish, but in processing experiments aboard the Shoyo Maru this was found to be impossible. Hitherto it has been said that green meat is likely to occur in fish in which the meat pigment has oxidized, but green meat appeared unpredictably in cases where the oxidation was not distinguishable by the naked eye. Fish weighing up to about 88 pounds were found to be all right, regardless of the area of capture, but off-colored fish turned up in those of 110 pounds or larger. This was true only for the Caribbean, and not one case of green meat was seen in large fish from the North Atlantic. The condition was unrelated to whether the fish was fresh or frozen,

Japan (Contd.):

but the texture of the meat was somewhat poorer in frozen fish.

Albacore from the Caribbean were of good quality, somewhat between Japanese summer and winter albacore in size.

It was concluded that there is a need for biological study of yellowfin over 88 pounds in order to discover the cause of the formation of green meat. These large fish, even though the meat is not green, yield a poor color after processing.

There was no problem with albacore from near the Equator; however, if processing was not done well, the color was dark. There is a special need for detailed study of albacore from the vicinity of 30 degrees north and south latitude. (The Suisan Keizai, June 25, 1960.)

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FISHERY AGENCY SETS POLICY ON TUNA IMPORTS FROM RYUKYU ISLANDS:

In recent months the Japanese Fishery Agency has been studying the probable effects on the Japanese fishing industry caused by the future liberalization of Japan's imports of fishery products. As regards tuna, the Agency and the Japanese industry have been most worried by the prospect of fish from the Ryukyus entering Japan in considerable quantities. These fears have been reinforced by the Okinawans' desire to build up their tuna fishery, as evidenced by their efforts to buy second-hand tuna boats in Japan.

The Japanese fishery trade press reports that an understanding on this matter has now been reached between the Fishery Agency and the Ryukyu Government. According to these reports, the Ryukyus will not take any actions that would impair the effectiveness of Japanese administrative controls over tuna fishing and the trade in tuna products. For its part, the Japanese Fishery Agency will approve the importation of up to 500 metric tons yearly of tuna and spearfishes from the Ryukyus and the exportation

tion of 2,000 tons of tuna boats over a five-year period.

Press comment on this development emphasizes Japan's residual sovereignty over the Ryukyus, stressing the opinion that since the Ryukyus are not really a foreign country it is appropriate for Japan to assist the development of the fishing industry there. At the same time, the Fishery Agency has made it clear that it cannot allow direct landings in Japanese ports by Ryukyuan tuna boats, and the import of tuna from the Ryukyus will be formally handled by designating tuna as a permissible import item under the category "Materials from Southern Countries." (United States Embassy report from Tokyo, June 3, 1960.)

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SALMON CATCH LIMITS FOR LAND-BASED GILL NETTERS SET:

On June 20, 1960, the Japanese Fishery Agency informed the Hokkaido Government and other local jurisdictions of its policies for allocating the salmon catch quota for land-based vessels operating within the Japan-Soviet treaty area south of 48° N. latitude. The Agency's announcement relates to the 264 boats of over 30 tons gross which have licenses from the Minister of Agriculture.

The catch quotas are to be 33.8 metric tons for each vessel of 30 to 39.99 tons gross, and 39.8 tons for each vessel over 40 tons gross. Operating licenses for the treaty area were to be issued at the boat owner's application after June 25.

The changes in operating area limits which had been strongly demanded by the All-Japan Salmon Fishermen's Federation were refused by the authorities, and a final decision was made to add to the operating area for these vessels only the rectangle bounded by 46°-48° N. lat. to 165°-168°35' E. long., which will be open to land-based fishing after the first of July. The Fishery Agency expressed the view that no other adjustment of the fishing area was possible because of the closing of two new areas this year and the closing of the large triangular area east of the Kuriles last year.

The decision as to how to allocate the catch quota of 13,500 metric tons for

Japan (Contd.):

land-based vessels in the treaty area among various vessel tonnage classes was left entirely up to the Salmon Fishermen's Federation. In addition to the 264 vessels which have ministerial licenses, there are 151 vessels licensed by the Governors of the Prefectures. For the latter, the catch limits will be 9.8 metric tons for 5- to 10-ton vessels, 11.8 tons for 10- to 15-ton vessels, 19.8 tons for 15- to 20-ton vessels, and 33.8 tons for 20- to 30-ton vessels. (The Suisan Tsushin, June 21, 1960.)

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NORTH PACIFIC SALMON FACTORY- SHIP OPERATIONS OFF TO GOOD START:

The Japanese North Pacific salmon factoryship fleets all reached their fishing grounds on May 25, 1960, and began to take on fish from nets that had been set by the catcher boats which preceded them. On the average, each mothership received about 40 tons of salmon on the 25th. Of this amount as much as 80 percent was red salmon, marking a good start for the season. It was expected that full-scale landings, with all catchers hauling nets, would begin around May 27. The fleet escaped the usual May storms. (The Suisan Tsushin, May 28, 1960.)

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NORTH PACIFIC SALMON FISHERY TRENDS, JUNE 1960:

On June 21, 1960, the Japanese Ministry of Agriculture reported as follows on the progress of this year's North Pacific salmon fisheries:

The mothership fishery, as of June 15, had taken slightly under 15,000 metric tons. This was about 27 percent of the mothership's 54,000-ton catch quota. Last year at the same time about 20,000 tons had been taken, but the lower catch this year is the effect of delay in the fleets' sailing. The over-all success of the season would be decided by the catch in the period beginning in late June, when pink salmon appear.

There are no accurate reports as yet of the operations of the land-based gill-

net fishery, but the operators say that the catch is about 20 percent below last year's. However, the price is up, so the profit situation is not too bad.

So far Japanese patrol boats have caught four salmon boats violating regulations, and the Government is going to deal with them sternly, so as to prevent violations in the future. The Soviets have not yet cited any Japanese boats for violations.

The Hokkaido Fisheries Experiment Station in mid-June released the following on ocean conditions and fishing conditions in the first 10 days of June:

Ocean conditions: Because salmon fishing was concentrated west of 155° E., sea conditions east of that longitude and off northeastern Honshu were unknown. East of 150° E. water temperatures were 1 to 2 degrees higher than in the preceding 10-day period, but there were no major general changes.

Fishing conditions: Small salmon boats under 7 tons gross were concentrated in the three ports of Kushiro, Akkeshi, and Hanasaki on the east coast of Hokkaido, and pink salmon availability was not as good as in the preceding period. Offshore there were still no boats operating east of 155° E. Fishing was concentrated in a zone of 42.8°-46.4° F. water temperatures extending from 149° E. northwestward to 155° E. In the area centered around 42° N., 149°-150° E., small vessels in large numbers were fishing for pinks and having extremely poor luck. Most of the larger boats were concentrated in the area centered around 43° N., 151°-152° E. The area centered around 44° N., 154° E., continued to be occupied largely by long-line boats. Pink salmon catch rates were fair until June 14 or 15, when they became poor. (Suisan Keizai Shimbun, June 21 and 22, 1960.)

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NORTH PACIFIC SALMON PRICE NEGOTIATIONS ABOUT CONCLUDED:

Negotiations over the ex-vessel price of North Pacific salmon have been under way since early in May between the North Pacific Fishery Council (formed of 8 salmon mothership operating companies)

Japan (Contd.):

and the Japanese Federation of Salmon Fishery Cooperative Associations (the catcher boat owners' association). On June 22, 1960, negotiations were to enter the final stage at Tokyo. Both sides wanted to settle salmon prices quickly, and an agreement was expected by the end of June.

The outstanding feature of this year's negotiations is that both mothership operators and fishing boat owners have revealed their operating expenses in an attempt to work out a reasonable fish price. At a meeting on June 20 it turned out that the figures offered by the two sides were based on different estimates. Therefore, a meeting was held on June 22 for a final reconciliation of views.

In 1959, salmon prices were raised about 11 percent above those of the previous year, and averaged for all species about 97,000 yen (US\$270) a metric ton. This year the fishing boat operators are again asking for an increase, because the Japan-Soviet fishery negotiations resulted in a cut in the total salmon catch quota, and it looks as if a raise of the average price for all species to over 100,000 yen (US\$278) a metric ton will be unavoidable. (Nippon Keizai Shimbun, June 22, 1960.)

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EARLY SALES CONTRACTS TO UNITED STATES FOR CANNED PINK SALMON DELAYED:

Generally in mid-June contracts are made for early shipments of pink salmon (No. 4 cans^{1/}) to the United States, but this year production in Hokkaido has been light, and there are indications of an overall drop in pink salmon production. As a result, there does not seem to be any particular necessity for promoting sales to the United States. Buyers in the United States also are showing no haste to buy because of prospects for increased production in Alaska. For these reasons the Japanese joint sales company and the trading firms have not actively opened sales talks. There was a strong possibility that signing of sales contracts would be delayed until July. Furthermore, there were good prospects that

^{1/}Equal to U. S. 1-lb. can.

the quantity available for early shipment would be only about half of last year's approximately 70,000 cases.

The beginning of packing in Hokkaido was delayed by about one week this year and because of high ex-vessel prices packing was held down. There is also a tendency to wait until late in the season to pack No. 4 cans, due to a low profit margin, and it is estimated that the pack would not be on hand until the latter part of July. It is probable that the pack of No. 4's, including factoryship pack, will be at most only about 150,000 cases, so that there is little need for rushing ahead with contracts for early shipment. It is estimated that the US\$17 price per case of the last half of the 1959 season will be maintained (last year's price for early shipment was \$16.75). (The Suisan Tsushin, June 18, 1960.)

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KING CRAB QUOTA INCREASED FOR BRISTOL BAY FACTORYSHIP:

On June 21, 1960, the Japanese Fishery Agency granted a 10,000-case increase in the production quota of the Bristol Bay king crab factoryship Tokei Maru, formally raising the quota to 80,000 cases. The increase had been requested some time ago by the three joint operating companies.

In connection with this quota increase the operators of the other Bristol Bay crab mothership, the Shinyo Maru, had also requested a larger production quota, but the authorities withheld action on that request. The Tokei Maru was expected to fill her original 70,000-case quota by the end of June, and it was considered possible that she would complete production of the 80,000 cases by the middle of July. (The Suisan Tsushin, June 22, 1960.)

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BERING SEA FISHERY FOR BOTTOM FISH TO BE RE-EXAMINED:

The Japanese Fishery Agency is to re-examine its licensing policy for the Bering Sea freezer-ship-mothership flatfish fishery fleet and similar trawling operations due to begin in September 1960. This re-examination will involve the condition of the resources, the problem of

Japan (Contd.):

competition with the fish-meal factory-ship-mothership fleets, and the number of licenses to be issued this year.

This year there are already four trawling fleets in the Bering Sea with the fish-meal factoryships Renshin Maru, Shinyo Maru, Gyokuei Maru, and Soyo Maru. They have been operating for four months and have already passed last year's catch of 140,000 metric tons of fish, and operations are continuing.

Beginning in September, the same grounds will be fished by fleets producing frozen flatfish. This year three large fishing companies are planning to send out a total of four such freezer-ships--the Chiyo Maru, Miyajima Maru, Kashima Maru, and Kyokuzan Maru.

The Fishery Agency foresees that with the 8 fleets, plus a 9th fleet out for arrow-toothed halibut, competition on the fishing grounds will become sharper. Furthermore, changes in the resources are appearing as a result of the fish-meal operations, and there will have to be discussion of such questions as: Whether or not it is all right for the industry to go ahead with its planned fish-meal and fish-freezing operations? What problems will come up from the standpoint of economical operation of the fleets? How are the fishing grounds to be assigned? (The Suisan Keizai, June 22, 1960.)

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CATCHES OF FISH-MEAL FLEETS DROP SHARPLY:

Of the five Japanese fish-meal factoryship fleets operating this year, the Soyo Maru and Tenyo Maru fleets are operating northwest of St. Paul Island, while the other three--Kinyo Maru, Renshin Maru, and Gyokuei Maru--are fishing in Bristol Bay. During April and May this year each fleet was making catches of around the planned 600 metric tons a day, but in June a downward trend in the catches appeared, and they were able to take only about 300 tons a day, some days even less.

Japanese Fishery Agency authorities are watching the trend of the fish-meal

fleet catches closely, in connection with the licensing of the frozen flatfish fleets, which are scheduled to begin operating in mid-August. They have begun an investigation of the causes of the sudden drop in catches in June, and the prevailing view is that there is a limit to the resource, because the fishery works on bottom fish and because the fishing grounds are limited in extent.

Taking the experience of one of the fish-meal fleets as an example, catches for the first 5 days of June ranged from 378 to 483 metric tons. From the 6th to the 9th they improved to between 580 and 720 tons, but from the 10th on they declined again. On the 22nd the catch was 220 tons, the lowest since fishing began at the end of April and a catch level that was completely unanticipated. The Fishery Agency will make a report and try to devise some countermeasures, as soon as some conclusions have been reached, but it does not appear that the Japanese authorities are considering cutting down on the frozen flatfish fleets because of the poor catches of the fish-meal fleets.

Present plans are for 6 flatfish freezer fleets to operate this year, after the salmon motherhip fishing season. One large fishing company will send out two flatfish freezer-ships, and three other companies will send out one each. In addition the motherhip Otsu Maru will operate in cooperation with the Hokkaido Trawlers' Federation. (The Suisan Tsushin, June 25, 1960.)

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IMPORT RESTRICTIONS ON SOME FISHERY PRODUCTS LIBERALIZED:

The Japanese newspaper Suisan Keizai of June 23, 1960, reported the following schedule planned by the Japanese Government for the liberalization of imports of fishery products: Items to be liberalized immediately: edible frogs, frozen rainbow trout, fish eggs, shark fins, fish livers; canned oysters; scallops; red, silver, and pink salmon; tuna, mackerel, saury, sardines, king crab, shrimp, squid, abalone, topshells, clams, fish eggs, crustaceans; and whale oil, harpoons, artificial gut line, and fish nets.

Items to be liberalized within three years: frozen tunas, broadbill sword-

Japan (Contd.):

fish, marlins; salted and frozen salmon and sea cucumbers; shrimp; and agar-agar.

Items not to be liberalized: whale meat; fresh marlins, snappers, yellow-tail, mackerel, herring, sardines; frozen cod; eggs of herring, cod, and salmon; dried scallops, squid, and seaweed; and fish meal.

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SEAWEED INDUSTRY TRENDS,

JUNE 1960:

Bidding for this year's gelidium or agar-agar seaweed began in June 1960 at various Japanese producing areas. In some places the price was very high. The raw seaweed for agar-agar is commanding higher prices because of the decline in production and the increase in demand in 1959.

Last year the gelidium crop was poor, with production on the Muroto coast of Kochi Prefecture down by 50 percent, and for the country as a whole down about 20 percent. Gracilaria production was only about one-sixth of normal in the main producing area of Akkeshi Bay, and for the country as a whole it was down about 35 percent. For several years the average annual production has been about 11,578,000 pounds of gelidium and about 8,270,000 pounds of other agar-producing seaweeds. On the other hand, the demand is considered to be about 16,540,000 pounds of gelidium and about 9,097,000 pounds of other kinds of seaweed.

The difference is made up by imports from other countries. Until 1958 imports were about 2.5 to 3.3 million pounds, but last year imports jumped to 6.6 million pounds. Prior to 1958, imports were all from Korea, but last year seaweed was bought from countries all over the world, and it is thought that the problem will become quite complicated in the future.

In 1959, a phenomenon appeared which merits the attention of the agar-agar industry. At the city of Hachioji, the Japan Seaweed Industry Corporation built

a large factory. The company's production plans are said to call for making 1.2 million pounds of agar-agar from gelidium and 300,000 pounds from gracilaria. Calculated in terms of raw weed, this is nearly 5 million pounds of gelidium and 840,500 pounds of gracilaria. This new fact poses a big problem for the producers, as to how to devise a rational and profitable system for supplying raw material.

It is expected from present indications that the national production of seaweeds this year will be 10 to 20 percent above 1959. However, demand has grown more than this, and competition for raw material is growing more vigorous, raising prices with it. This raises the danger of the processors' turning to imported material. (The Suisan Keizai, June 17, 1960.)

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KOREAN AGAR-AGAR

SOON TO REACH JAPAN:

The agar-agar from South Korea, which a Japanese trading firm is importing for the Japan Sea and Land Products Export Association, was expected to reach the port of Kobe, Japan, the latter part of June. The quantity is 150,000 pounds. The shipment was delayed because the Korean exporters asked for a price increase, but the Japanese purchasers gave ground to the extent of US\$1.25 a pound, and the deal went through.

The Japan Sea and Land Products Export Association, in order to maintain overseas markets for Japanese agar-agar and expand exports, made its first importation of 300,000 pounds of Korean agar in 1959 and re-exported the material. The present shipment is the second importation by the Association. The agar-agar will be sorted in bonded customs warehouses and then exported.

Exports from January to December of 1959 were 1,597,176 pounds, valued at 694,864,000 yen (US\$1,931,722). Since December 1959, when controls on quantity and price were imposed, exports have been as follows: December 1959, 56,159 pounds (US\$79,249); January-March 1960, 612,931 pounds (US\$957,557). (Nippon Suisan Shimbum, June 24, 1960.)

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Japan (Contd.):

**PEARL EXPORTS IN 1959
SET NEW RECORD:**

The All Japan Pearl Culture Cooperative (AJPCC) in Ise City, Mie, exported 39,983 kg. (88,147 pounds) of cultured pearls during 1959, valued at ¥8,570 million (US\$23.8 million), the highest export record in the industry's history. This exceeded the 1958 exports by 6,400 kg. (14,109 pounds) in weight and ¥2.2 billion (\$6.1 million) in value and the industry's 1959 export goal by \$3.8 million.

The United States took 55 percent of the export total as the largest customer, followed by Switzerland which bought 14 percent, West Germany with 7.5 percent, and India with 4 percent. The average ex-factory price for export pearls showed a fairly sound market price of ¥802 (\$2.23) per momme (3.75 gr., about 0.132 ozs.) despite some overproduction. Due to a typhoon--which killed a great number of mother-oysters due for harvesting in 1960--the cooperative anticipated a strong market through the first half of 1960. (United States Embassy, Nagoya, December 28, 1959.)

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**PEARL-SHELL OPERATIONS IN
ARAFURA SEA, JUNE 1960:**

The Japanese Arafura Sea (off northern Australia) pearl-shell fleet reached the fishing grounds on May 23, 1960. As of June 11, the fleet had worked one-and-a-half tidal cycles and had gathered 59 metric tons of shell. This year the shell is small, but the quality is extremely good, and those concerned consider that the limit of 415 tons will be reached. The mothership Yamato Maru and 11 luggers worked off Port Darwin from May 23 to June 11. Operations will continue to the end of October, with the latter part of the season to be spent in the vicinity of Thursday Island.

The world market for pearl shell began to fall around 1955 and hit the bottom last year. It is expected to recover somewhat this year. The Japanese pearl-shell company considers that the resource is in good condition, which is also recognized by the Australians, and

with good shell quality, they are expecting an upturn in the market. It is also expected that there will be a favorable effect on next year's negotiations with Australia over the fishery. Last year the catch limit was 375 tons, but only 346 tons were taken. This year it is considered quite possible to take 390 to 400 tons. The fleet is scheduled to return to its base at Kushimoto about November 15. (Nippon Suisan Shimbun, June 15, 1960.)

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**FISHING VESSEL CONSTRUCTION,
JUNE 1960:**

The Shimonoseki branch of a large Japanese fishing company has begun work on its fourth large stern trawler, which will be the largest in Japan. Keel-laying ceremonies for the 1,850-gross-ton vessel, as yet unnamed, were held on June 18, 1960, at the company's shipyard. Completion is scheduled for the end of September.

A Japanese fishing company will begin construction of a 1,300-gross-ton tuna long-liner, the Eiho Maru, on July 11 at Shimizu. The vessel will be a sistership to the owner's recently-completed Eio Maru, and will be finished around November. Particulars are: gross tonnage 1,280; length 238.5 feet; beam 37.7 feet; depth 17.4 feet; refrigerated holds 52,900 cubic feet; maximum speed 14.5 knots; main engine, a 1,000-hp. Diesel.

A Nagasaki shipyard has recently begun construction on a 1,246-gross-ton tuna long-liner ordered by a large Japanese fishing company. This vessel is designed to carry 4 small fishing boats, for which it will serve as a mothership in operations off the West African coast. The vessel will be 219.8 feet long, 39.4 feet in beam, and will have a variable pitch propeller. Launching is scheduled for September 7 and completion for mid-October. Also, a 243-gross-ton tuna long-liner is being built for a private owner in Yaizu.

The above vessels are included among 49 construction permits for fishing vessels issued by the Japanese Fishery Agency on May 27, 1960. (Nippon Suisan Shim-

Japan (Contd.):

bun, June 22, and Suisan Keizai, June 24, 1960.)

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TRAWLER REPORTS GOOD FISHING OFF NORTHWEST AFRICA:

A large Japanese fishing company's 1,490 gross ton stern-trawler No. 62 Taiyo Maru started fishing early in June off the Canary Islands, off northwest Africa. Reports reaching the owner's Shimonoseki offices indicate that catches are better than expected, running 10 to 20 metric tons a day. The catches are more than 90 percent red snappers, with gurnards and croakers also appearing in the catch. The vessel is scheduled to return to its home port of Shimonoseki the latter part of August.

The owners say that in addition to this vessel, the northwest African grounds are also being fished by the same company's No. 6 Taiyo Maru, based at Tangier, and by the Uji Maru, operated by another large Japanese fishing company. Other Japanese trawlers headed for the area are the No. 63 Taiyo Maru, which will begin fishing June 23, the Asama Maru, Tatsuta Maru, and Seiju Maru. (Nippon Suisan Shimbun, June 22, 1960.)



Kuwait

SHRIMP FISHERY IN PERSIAN GULF INITIATED:

A United States firm of New York City in partnership with a Kuwaiti firm has been engaged in shrimp fishing in the Persian Gulf since the first of 1960. Two shrimp trawlers were purchased in Florida by the Kuwaiti firm for US\$180,000 in 1959 and were brought to Kuwait (south of Iraq on northwest coast of Persian Gulf) late in the year. The captain and engineer on each boat are American and the remainder of the crew, an assortment of Persian Gulf fishermen--Persians, Arabs from the Trucial Coast, and Baluchis.

This activity has been profitable for all the participants. Although the boats did not start operations until the middle of the season (August 15-April 15 in this part of the Gulf), they caught over 240,000 pounds of shrimp which were deheaded, frozen, and packed in five-pound cartons on board the trawlers. The frozen shrimp are delivered to freighters for shipment and subsequent sale in the United States. The local firm reportedly realized about \$150,000 in the sales and after deducting production expenses of about \$50,000 realized a gross profit of \$100,000. The United States firm, which has put out no capital, acts solely as a selling agent in the United States.

The United States captains of the trawlers are paid \$1,500 per month plus a bonus of \$25 a ton of shrimp delivered. The engineers are paid \$800 per month and a bonus of \$15 a ton of shrimp. The crew members are given room and board and paid wages of about \$41--considerably above the usual rate in the Gulf.

The shrimp trawlers fish in waters of 35-45 feet, but their range is quite limited. They rarely go beyond 40 miles from Kuwait territory and, as Kuwaiti fishermen object if they come too close to shore, they usually remain about 8 miles from mainland Kuwait.

The shrimp are found in considerable quantity within the restricted area fished and, according to the United States fishermen, these waters could probably support sustained catches of over one million pounds per year. Much of the fish, which are caught incidentally during shrimp trawling, is sold on the local market. The Government will not permit its sale for export. (United States Consulate, Kuwait, May 31, 1960.)



Malaya

IMPORTS OF MARINE OILS, 1959:

Malaya imported 250 long tons of marine-animal oils in 1959 as compared with 137 tons in 1958--only one ton was exported each year. Singapore and Pe-

Malaya (Contd.):

hang are free ports and have no import duties on marine-animal oils. But the Federation of Malaya full and preferential import duty on marine-animal oils is 25 percent. (U. S. Foreign Agricultural Service Report, Kuala Lumpur, April 12, 1960.)



Mexico

MARINE-OIL IMPORTS AND EXPORTS, 1958 AND 1959:

Imports of marine-animal oils by Mexico increased to 859 metric tons in 1959 as compared with about 680 tons in 1958. Oils imported from the United States rose sharply--from 87 tons in 1958 to 355 tons in 1959. In 1959 the United States was Mexico's main source of sperm-whale oil and fish-liver oil, and a leading source of whale oil. Practically all the sperm, cod, and fish-liver oils shipped by the United States to Mexico are re-exports.

Mexico's Imports of Marine Oils, 1958 and 1959		
Product and Origin	1959	1958
	. (Metric Tons) .	
Whale Oil:		
United States	24.6	14.2
Great Britain	29.9	34.4
Germany	8.9	15.8
Norway	17.4	1.3
Italy	3.4	-
Total whale oil	84.2	65.7
Sperm Oil:		
United States	31.8	1.5
Great Britain	8.8	10.3
Norway	5.6	-
Germany	0.3	-
Total sperm oil	46.5	11.8
Cod Oil:		
United States	75.7	57.5
Norway	365.9	364.8
Great Britain	11.2	11.2
Germany	3.4	5.7
Argentina	-	1.1
Total cod oil	456.2	440.3
Fish-Liver Oil:		
United States	222.9	13.5
Norway	38.2	130.8
Great Britain	11.2	17.1
China	-	0.4
Total fish-liver oil	272.3	161.8
Total all marine oils	859.2	679.6
Total imports from U. S.	355.0	86.7

The 365 tons of cod oil imported from Norway in 1959 and the 364 tons in 1958 were responsible for Norway's position as Mexico's main supplier of marine-oil products.

Exports of marine oils by Mexico in 1959 consisted of 100 tons of whale and shark oil to the United States as compared with 66 tons in 1958. El Salvador, Mexico's only other buyer of marine oils, received less than 1 ton in 1959 and none in 1958. (U. S. Foreign Agricultural Service Report, Mexico, April 19, 1960.)

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PRESIDENT STATES POLICY ON TERRITORIAL WATERS AND CONTINENTAL SHELF:

The President of Mexico in his Navy Day address on June 1, 1960, referred to his policy concerning the natural resources of the territorial waters and the continental shelf. According to the June 2, 1960, issue of the Mexico City newspaper *Novedades*, the President said: "The resources of our territorial waters as well as those of the continental shelf form part of our patrimony. Their exploitation, performed by Mexicans, in benefit of the people is a legitimate national aspiration. Consequently we shall oppose with all energy the utilization of such resources on the part of those who, having the material means for realizing it, nevertheless lack all right."

The above statement is a reiteration of the sentiment expressed in the 1959 constitutional amendments, according to a June 3, 1960, dispatch from the United States Embassy in Mexico City.

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SHRIMP FISHERY TRENDS, MAY 1960:

Price negotiations between the Mexican fishermen's cooperatives and vessel owners for the 1960-61 shrimp catch were postponed in mid-May. Current contracts were extended for a period of 90 days which were to expire August 13. Unless agreement was reached by mid-August, it was probable the fishermen would tie-up the vessels.

The Carmen-Campeche price war between independent vessels continued throughout May. The latest price increase was reported on May 19 when prices on most sizes were increased 1-3 U. S. cents a pound. Salina Cruz prices have been unchanged for two months.

Mexico (Contd.):

Mid-May ex-vessel prices in U. S. cents a pound at Carmen and Campeche for white, pink, and brown headless shrimp were the same for all sizes and were: under 15 count, 80; 15-20 count, 75; 21-25 count, 70; 26-30 count, 65; 31-35 count, 58; 36-40 count, 48; 41-50 count, 43; and 51-65 count, 36; over 65 count, 26.

Salina Cruz landings, after a drop in April and early May, picked up towards the end of May with boats landing between 2 and 3 tons of heads-off shrimp for a 13-day trip.

In both Carmen and Campeche average landings were up over April. In Carmen fishermen reported shrimp scattered, but landings averaged around 950 pounds of heads-off shrimp for 6-8 day trips. At Campeche landings averaged over 1,000 pounds per trip.

Sizes at Carmen tended to vary during May; about 40 percent of the landings were 30 and under count. As usual Campeche sizes ran larger, about two-thirds of the landings were 30 count and under.

Species composition of the landings both at Carmen and Campeche fluctuated during the month. However, at Carmen the distribution was about 40 percent white, 35 percent pink, and 25 percent brown. At Campeche the landings were about 70 percent pink with the remainder about evenly distributed between white and brown. (June 6, 1960, report from United States Embassy, Mexico.)



Netherlands

MARINE-OIL PRODUCTION, FOREIGN TRADE, AND CONSUMPTION:

Production: The Netherlands' production of marine-animal oils decreased from 30,277 metric tons in 1958 to 24,110 tons in 1959 due to the drop in whale oil production in 1959.

The production of refined and refined hardened oils from fish and marine-animal

oils increased from 54,426 metric tons in 1958 to 60,745 tons in 1959.

	1959				Total	1958
	Quarter					
	First	Second	Third	Fourth		
	(Metric Tons)					
Fish oils	526	999	2,502	1,189	5,216	4,425
Whale oil	116	18,778	-	-	18,894	25,852
Sperm oil	-	1	-	-	1	-
Total	642	19,778	2,502	1,189	24,111	30,277

Exports: In 1959 the Netherlands exported 8,537 metric tons of processed fish and marine-animal oils as compared with 7,368 tons of crude.

Destination	Fish and Marine Oils	Total
	Crude or Processed ... (Metric Tons) ...	
Common market and associated countries . . .	7,167	7,554
Other O.E.E.C. countries and associated areas . . .	192	8,075
Other countries	9	246
Total	7,368	18,875

Imports: Whale oil comprised 63 percent of the Netherlands marine-animal oil imports in 1959; other fish oils 33 percent and sperm oil only 4 percent. The import pattern for all fats and oils is expected to remain unchanged.

Origin	Whale Oil	Fish Oils	Sperm Oil	Total
	... (Metric Tons) ...			
Common market and associated countries . . .	20,228	1,640	76	21,944
Other O.E.E.C. countries and associated areas . . .	13,251	6,459	741	20,431
British Dominions	2,461	120	891	3,472
Other countries	12,040	12,976	640	25,656
Total	48,000	21,195	2,348	71,553

Consumption: The use of sperm oil for technical purposes decreased slightly from 2,378 metric tons in 1958 to 2,285 tons in 1959; the quantity of marine-animal and fish oils used for technical purposes remained relatively stable--837 tons were used in 1958 and 830 tons in 1959. (U. S. Embassy at The Hague, May 16, 1960.)



Nicaragua

SHRIMP FISHERY TRENDS, MARCH 1960:

Exports of shrimp from Nicaragua during the first quarter of 1960 amounted to about 110,000 pounds. Practically all the shrimp exports during the first quarter of 1960 were made from the port of El Bluff on Bluefields Island by the French shrimp fishing, freezing, and processing company which was established in 1959.

During 1959 shrimp exports (about 96 percent to the United States) totaled 445,854 pounds. This total compares with 610,086 pounds, valued at US\$319,321, exported in 1958; and only 2,784 pounds, valued at \$1,325, in 1957.

The French-owned shrimp fishing and processing company in Bluefields is expected to have a permanent freezing and processing plant completed in July this year. The new plant will have a processing capacity of about 30 tons of shrimp per day and a storage capacity of 200 tons. Future plans call for a work force of 150 and a fleet of 60 fishing and auxiliary vessels. (United States Embassy, Managua, May 3, 1960.)



Norway

HERRING AND LOFOTEN COD FISHING POOR IN 1960:

The Lofoten cod fisheries season which ended in May yielded the second poorest catch since the war. According to preliminary figures, it totaled about 37,000 tons, with an ex-vessel or first-hand value of Kr. 37 million (US\$5.2 million), compared with the lowest post-war catch of 33,841 tons in 1958. Unfavorable weather and the prohibition of seine fishing in the Lofoten fisheries during the last two years were mainly responsible.

The winter herring fisheries also had exceptionally poor results this year, with a total catch of 2 million hectolitres (186,000 metric tons), just over 50 percent of last year's catch and the smallest since the war. This is the third con-

secutive year that the winter herring fisheries have been considered a failure. (Canadian Foreign Trade, June 18, 1960.)

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TASTELESS AND ODORLESS HERRING FLOUR DEVELOPED:

A method for producing herring flour with no taste or odor whatsoever, intended to be mixed 1-10 with grain flour for baking bread and rolls, has been perfected by the Norwegian Fishery Directorate's Ocean Research Institute in Bergen. (News of Norway, May 26, 1960.)

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TO EXTEND FISHING LIMIT TO 12 MILES:

In a statement to the Norwegian Parliament on May 13, the Foreign Minister deplored the failure of the recent 88-nation conference on the Law of the Sea, at Geneva, to reach agreement on new universal limits for territorial and fishery zones. Under the circumstances, he said, the Government sees no alternative but to make the necessary preparations for extending Norway's fishing zone from 4 to 12 miles. This move is designed to provide better protection for coastal fishermen against the damage to fixed gear wrought by foreign trawlers year after year, and thus assure the livelihood of Norwegian fishermen in the future.

Foreign fishing vessels are now barred from a zone delimited by a series of straight lines drawn 4 miles from, and parallel to, so-called base lines between extreme points of North Norway.

The Foreign Minister said the Government was aware that extension of the fishing limit might cause serious difficulties for foreign fishing vessels now operating in Norwegian waters between 4 and 12 miles. To make it easier for these fishermen to adjust to the new situation, the Government is willing to begin negotiations with other countries on reasonable transition arrangements. Whether such negotiations should be conducted on a bilateral basis with individual foreign countries, or multilaterally with a group of countries, is a question that has not been decided as yet.

The Foreign Minister stressed that the Norwegian Government has always advocated that solution of the territorial and fishery zone questions should be sought through international agreement, with the greatest possible participation. Fishermen's organizations have repeatedly demanded that the fishing limit be extended to 12 miles, and each time the Government has urged patience while the United Nations was seeking a global solution. Now, however, the Government feels that it would no longer be justified in postponing the extension.

The Norwegian delegation to the 1960 conference in Geneva was instructed to support the Canadian proposal calling for a territorial sea limit of 6 nautical miles and an adjacent 6-mile fishing zone. Norway's shipping and aviation interests, the Foreign Minister declared, make it desirable that territorial waters in all parts of the world be limited as much as possible, and not exceed 6 miles, at any rate. The interests of Norwegian fishermen, on the other hand, require the opportunity to establish a 12-mile wide fishing zone, with exclusive rights for fishermen of the coastal state. To be sure, the interests of Norwegian whalers, sealers, and deep-sea fishermen operating off the coasts of other nations pull in the opposite direction. But, on the basis of an over-all appraisal, one must say that Norwegian economic interests are best served by a fishing zone of 12 miles.

At a later stage of the conference, Norway decided to back the compromise worked out between the Canadian and the United States proposals. This called for a territorial sea of 6 miles, plus an adjacent 6-mile fishing zone, with a 10-year

Norway (Contd.)

period for liquidation of so-called traditional fisheries conducted by foreign fishermen in waters between the 6 and 12 mile limits. Norway was one of the 54 nations which voted in favor of the compromise proposal. Unfortunately, this failed by one vote to receive the necessary two-thirds majority.

"The negative outcome in Geneva," the Foreign Minister told Parliament, "is a regrettable defeat for efforts to clarify, codify, and develop international law. As a result, there will continue to be doubt and uncertainty regarding the width of the offshore waters that a state, according to international law, can subject to its own sovereignty, wholly or partly. This uncertainty will give rise to disputes, which in some instances may lead to serious conflicts. The continued doubt about international rules in this important area is especially unsatisfactory for such a small country as Norway. Because of our weak position in world politics, we are obliged to seek protection for our economic interests on the sea in rules established by international law," he declared. (News of Norway, May 19, 1960.)

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VESSEL OWNERS' ASSOCIATION PROTESTS 12-MILE FISHING LIMIT:

The chairman of the Norwegian Association of Fishing Boat Owners (representing fishing boat owners in south and west Norway that carry on ocean fishing off the coasts of Greenland, Newfoundland, the Faeroes, etc.) has stated to the press that his Association will protest against the Norwegian Government's announced intention to extend the national fishing boundary to 12 miles. He is reported to have stated that similar action can be expected by other nations in the North Atlantic area, which will mean the exclusion of the Norwegian high-seas fishing vessels from their traditional areas of operation and that the 12-mile limit being enforced by Iceland had already created serious problems for the Association's members. (United States Embassy, Oslo, May 27, 1960.)



Pakistan

FISH OIL IMPORTS, 1958 AND 1959:

Imports of hardened fish oil by Pakistan decreased from about 108,800 pounds in 1958 to about 41,000 pounds in 1959, while the imports of other fish oils increased from 16,900 pounds in 1958 to 562,800 pounds in 1959.

In 1959, imports of 12,300 pounds of hardened fish oils from Norway were down sharply from the 106,600 pounds imported in 1958. However, Norway's

Pakistan's Imports of Fish Oils, 1958-1959		
Product	1959 ^{1/}	1958
	(In 1,000 Lbs.) ^{2/}	
Fish Oil (hardened):		
West Germany	4	2.2
Norway	12.3	106.6
United Kingdom	25.3	-
Total	41.0	105.8
Fish Oil:		
Norway	562.8	-
West Germany	-	16.9
Total	562.8	16.9
Total all fish oils	603.8	125.7

^{1/} Estimated.
^{2/} Original data in quintals converted to pounds at 1 cwt = 112 pounds.

exports of other fish oils to Pakistan jumped from zero in 1958 to about 563,000 pounds in 1959. (U. S. Foreign Agricultural Service Report, Karachi, April 18, 1960.)



Peru

ANCHOVY FISHERMEN DISPUTE WITH REDUCTION PLANTS DECLARED ILLEGAL:

Peruvian plant and vessel owners have refused to meet demands of anchovy fishermen for a specified price per ton for anchovy and for social benefits. The Government declared the dispute illegal on May 21, 1960, and under this decision, fishermen must return to work or employers may replace them without legal obligation. The fishermen were due to return to work May 27, for a 25-day period, during which they intend to request reconsideration of their demands. (United States Embassy, Lima, May 27, 1960.)



Philippines

IMPORTS OF FISH OILS, 1959:

Total fish oil imports by the Philippines decreased to 154,600 pounds in 1959 as compared with 168,700 pounds in 1958. However, imports from the United States increased from 19,400 pounds in 1958 to 30,400 pounds in 1959. More was also received from Japan and other nations, but imports from Norway and Western Germany were off appreci-

Philippines (Contd.):

Philippines' Imports of Fish Oils by Country of Origin, 1958-1959				
Country of Origin	Quantity		Value	
	1959 (1,000 Lbs.)	1958	1959 (\$US\$1,000)	1958
United States	30.4	19.4	7.1	6.4
Norway	63.5	91.4	7.5	11.1
West Germany	0.5	10.8	0.5	1.4
Japan	43.1	39.1	6.5	6.3
Others	17.0	7.9	1.5	2.1
Total	154.5	168.6	23.1	27.3

ably. (U. S. Foreign Agricultural Service Report, Manila, April 18, 1960.)

CANNED SARDINE BIDS RECEIVED COMPLY IN PART WITH LABELING REQUIREMENTS:

Because Japanese suppliers were at first unwilling to comply with the Philippine National Marketing Corporation's (NAMARCO) labeling requirements, a NAMARCO spokesman reported that Japanese sardines would be boycotted in favor of United States or South African brands. This statement seemed to be borne out later when a special invitation to bid for 80,000 cases was issued for "American and South African Sardines Preferred."

Eight bids were received at the special opening on June 29, 1960, five of which were nevertheless for Japanese sardines, one for American, and two for South African. The price spread for all bids received was only 7 U.S. cents per case of 24 cans except for the California sardines which were US\$9.00 per case c.i.f. Manila compared with \$7.53 to \$7.60 for the other bids. All bidders complied in the same manner to the marking requirements by agreeing to emboss the word NAMARCO on the top of the tins only, but not on the bottom. Each Japanese supplier quoted two prices--one with the lids embossed, and one without the embossing at five cents a case less.

NAMARCO officials consider it a victory that the Japanese gave in on the embossing requirement. Undoubtedly Japanese firms will get at least part of the business because no single bidder

offered more than 20,000 cases. (United States Embassy, Manila, July 1, 1960.)

LABELING OF CANNED GOODS IMPORTED BY NATIONAL MARKETING CORPORATION:

The new management of the National Marketing Corporation (NAMARCO), a government entity, prescribed new rules regarding labeling of goods which it imports starting with Invitation to Bid No. 2, dated April 22, 1960. This invitation requires that labels, whether imprinted or lithographed, should have a red, white and blue background with the identifying marks superimposed. The word "NAMARCO" must be embossed on top and bottom of tins and other containers. Extra labels equivalent to 1 percent of the total quantity ordered shall accompany the shipment, free of charge, in cases where the label is not lithographed on tins.

Prescribed labeling designs are attached for each commodity covered in the invitation--corned beef and two types of sardines. In addition to being embossed on the top and bottom of each tin container, the name NAMARCO must appear in large letters on the sides of the cans, with the result that the trade name is rather dwarfed in comparison.

NAMARCO officials stressed that this new plan is not an attempt to eliminate commercial labels completely and replace them with NAMARCO labels, but rather that the NAMARCO legend will be emphasized, while the personality of the brand will remain.

Already, however, NAMARCO is having difficulty with Japanese sardine suppliers over this new marking requirement. The Japanese claim that they cannot stamp the cans after the sardines have been packaged. They also state that they will not stamp them during the packaging process without a firm contract supported by a letter of credit from NAMARCO because of the danger that NAMARCO would not take all cans so marked, leaving the packers with sardines in NAMARCO tins which could not be sold elsewhere.

Philippines (Contd.):

Representatives in the Philippines of major United States suppliers have expressed the same position privately and indicated their bids will all be subject to a waiver of the labeling requirements. Philippine press indicated some United States suppliers would comply. (United States Embassy, Manila, May 18, 1960.)



Portugal

SARDINE FISHERMEN SIGN WAGE AGREEMENT FOR 1960:

A wage agreement for 1960 was signed on April 26, 1960, following negotiations between Government representatives and delegates of the sardine fishing organizations. Details of the 1960 agreement were not published as of May 13, but it is understood that the terms of the agreement were about unchanged from those established for the Matosinhos fishermen in 1959. During the negotiations on the wage agreement various pending problems of the 15,000 sardine fishermen were resolved, the United States Consul at Oporto reported on May 13, 1960.



Surinam

FISHERIES TRENDS, MAY 1960:

Fish consumption is important in the Surinam diet. According to estimates of the Fisheries Service, per capita consumption of fresh fish is about 42.1 pounds as compared with 15.2 pounds of fresh meat. In addition, important quantities of dried, smoked, and salted fish are consumed. Domestic production of fishery products does not meet total demands and in each of the past two years fish and fish products valued at over US\$530,000 were imported. Landings of fish and small shrimp (seabob) for domestic consumption is estimated at about 4,000 metric tons (8.8 million pounds) of which about 3,600 tons are sold in markets and about 400 tons are caught and consumed.

The Government's fisheries development program aims at doubling the domestic production by 1965. Some 700-800 fishermen are estimated to be employed more or less full time in the domestic industry. The fishing areas are limited to the rivers, creeks, swamps, and estuaries of the coastal area. Primitive fishing methods are used exclusively. The small native canoes are not seaworthy or adequate for offshore fishing operations. While production can probably be moderately increased by present methods, any major expansion would doubtless depend upon offshore fishing with modern trawlers. The possibility of introducing trawlers for bottom fishing is being studied.

Surinam's only substantial export of fishery products is large offshore shrimp. The shrimp are caught by trawlers off the coast of Surinam and frozen and exported by a firm which has an exclusive export right. In 1959, shrimp valued at \$270,000 were exported as compared with about \$82,000 in 1958. Shrimp landings and exports in 1960 are expected to be considerably above those of 1959. In early 1960 the shrimp exporting firm gave up its exclusive export rights to fishery products other than shrimp, in return for which it obtained certain concessions including authority to improve and expand its plant facilities. With the early completion of an ice plant it expects to be able to service an expanded fleet of trawlers. About 9 trawlers were in operation during May 1960.

Shrimp are being fished in the waters off the Surinam coast by trawlers based in British Guiana and Trinidad as well as those based in Surinam's port of Paramaribo. (U. S. Consulate in Paramaribo, May 31, 1960.)



Spain

FIRST FISH FACTORYSHIP UNDER CONSTRUCTION:

Spain is in the process of building its first fish factoryship *Maclina de Ciriza*. The 4,300-ton vessel will be capable of

Spain (Contd.):

catching and processing about 3,000 metric tons of fish which will be filleted and quick-frozen on board, according to Dansk Fiskeritidende, a Danish fishery trade periodical (Fiskets Gang, June 2, 1960.)



Sweden

BIOLOGICAL EFFECTS OF RADIOACTIVE CONTAMINATION IN LAKES UNDER STUDY:

A Swedish west coast fishery research scientist for some years has been engaged in investigating the effect of the radioactive outflow from atomic reactors on water in Sweden. During a four-months trip in 1956 to England and United States, he studied the biological problems that the utilization of atomic power has created.

(United States Consulate, Goteborg, May 24, 1960.)

* * * * *

CANNED FISH EXPORT CONTRACT WITH EAST GERMANY SIGNED:

The Swedish Fish Canners' Association has signed a contract with East Germany providing for export of canned fish, such as canned herring and anchovy, valued at 2,800,000 crowns (US\$540,400). The contract was signed at the Swedish Industries Fair, where East Germany for the first time was participating with an official exhibit. (United States Consulate, Goteborg, May 24, 1960.)

* * * * *

FISH AND SHELLFISH LANDINGS, 1958-59:

The Swedish fishing fleet landed 250,062 metric tons of fish and shellfish at home and abroad in 1959, an increase of 16 percent as compared with

Table 1 - Fish and Shellfish Landings by Swedish Fishermen (Including Landings in Foreign Ports), 1958-59

Species	Quantity		Value			
	1959 .. (Metric Tons) ..	1958	1959 (Sw. Kr. 1,000)	1958	1959 .. (US\$1,000) ..	1959
Herring, and Baltic Herring:						
Herring	116,307	97,112	54,847	50,350	10,596	9,728
Baltic herring	19,721	19,370	11,078	10,511	2,140	2,031
Total	136,028	116,482	65,925	60,861	12,736	11,758
Groundfish:						
Cod	25,536	26,932	17,347	17,561	3,351	3,393
Haddock	4,476	5,987	4,912	5,717	949	1,104
Whiting	2,612	2,778	2,261	2,101	437	406
Ling	2,766	3,057	2,742	3,032	530	586
Other	5,088	5,086	4,165	4,490	805	867
Total	40,478	43,840	31,427	32,901	6,072	6,356
Mackerel	12,178	13,287	8,813	9,230	1,703	1,783
Sprat	4,071	2,188	3,786	3,670	731	709
Other (including shellfish)	1/11,368	9,113	39,647	32,754	7,660	6,328
Not specified	4,102	4,351	5,043	5,202	974	1,005
Industrial fish	41,832	25,945	7,616	4,452	1,471	860
Total all fish	250,062	215,206	162,257	149,070	50,155	28,799

1/Includes: flatfish - 3,027 tons; eel - 2,239 tons; salmon - 1,305 tons; shellfish - 4,797.

Note: (1) Preliminary data. (2) Values converted at rate of one Sw. Kr. equals US\$0.1932.

The Swedish scientist is now studying the biological effects of the radioactivity level in Lake Tvären, which serves as the outlet for the atomic research institution at Studsvik. This check will be made by the Swedish Fisheries Board and the Radio Physical Institution, the latter is the top organization in Sweden concerned with protection from radioactivity. Similar control is also planned for Lake Magelungen, the outlet for the Agesta reactor, which will be Sweden's first atomic reactor for industrial use.

the 215,206 tons landed in 1958. The landings include fish for industrial purposes, such as for fish oil and fishmeal. This category represented over 16 percent of the total landings at home and abroad in 1959, and has in late years made up an increasing share of the total Swedish fish landings.

Landings at Swedish ports made up 67 percent of the total landings, while the remaining 33 percent were landed in Denmark, West Germany, and Great

Sweden (Contd.):

Britain. Compared with 1958, the domestic landings increased by 14 percent and the foreign landings by 21 percent.

crowns (US\$6.5 million), compared with 29,655,000 crowns (\$5.7 million) in 1958. Eighty-one percent of the total value of the 1959 landings abroad came from Denmark, while 14 percent came from West Germany, and 5 percent from Great

Table 2 - Fish and Shellfish Landings in Swedish Ports, 1958-59

Species	Quantity		Value			
	1959	1958	1959	1958	1959	1958
	.. (Metric Tons) ..		.. (Sw. Kr., 1,000) ..		.. (US\$1,000) ..	
Herring, and Baltic Herring:						
Herring	64,149	52,529	30,632	28,016	5,918	5,413
Baltic herring	19,721	19,370	11,078	10,511	2,140	2,031
Total	83,870	71,899	41,710	38,527	8,058	7,443
Groundfish:						
Cod	24,800	26,329	16,815	17,163	3,249	3,316
Haddock	3,942	5,287	4,489	5,221	367	1,009
Whiting	2,124	2,246	1,917	1,754	370	339
Ling	2,730	3,034	2,720	3,019	526	583
Other	3,859	4,297	3,308	3,917	639	757
Total	37,455	41,193	29,249	31,074	5,651	6,003
Mackerel	7,474	8,416	5,987	6,317	1,157	1,220
Sprat	3,937	2,111	3,700	3,572	715	690
Other (including shellfish)	1/11,306	9,077	39,566	32,695	7,644	6,317
Not specified	3,816	4,209	4,754	5,087	918	983
Industrial fish	21,111	11,533	3,652	2,143	706	414
Total all fish	168,969	148,438	128,618	119,415	38,558	36,516

1/Includes flatfish - 2,965 tons; eel - 2,239 tons; salmon - 1,305 tons; shellfish - 4,797 tons.

Note: Values converted at rate of one Sw. Kr. equals US\$0.1932.

The total value of the 1959 landings, including fish for industrial purposes, amounted to US\$31.3 million as compared with \$28.8 million in 1958, an increase of 9 percent. Landings in foreign ports accounted for the largest part of this increase and the total value of the foreign landings increased by 13 percent, while the landings in Sweden increased by 8 percent.

Total landings in Sweden increased from 148,438 tons in 1958 to 168,932 tons in 1959. The increase originates from the West and East Coast areas, where the landings increased by 25 and 3 percent, respectively, while the landings on the South Coast dropped by 6 percent.

The total quantity of fish landed in foreign ports by Swedish fishermen in 1959 amounted to 81,093 metric tons as compared with 66,768 tons in 1958. The larger part, or almost 70,000 metric tons, was landed in Danish ports. Of those landings, herring comprised 61 percent, while industrial fish made up almost 30 percent. Landings in West Germany and Great Britain also consisted chiefly of herring.

The total value of the foreign landings in 1959 amounted to 33,639,000

Britain, as compared with 90, 5, and 5 percent, respectively, in 1958.

The average price for fish landed in Sweden in 1959 (excluding industrial fish) amounted to 0.85 crown a kilo (7.4 U. S. cents a pound), the same as in 1958. The average price for the 1959 catch (including landings in foreign ports but excluding industrial fish) was somewhat lower than in 1958--0.74 crown a kilo (6.5 U. S. cents a pound) in 1959 as against 0.76 crown a kilo (6.7 U. S. cents a pound) in 1958. The average price for herring landed in Swedish ports was 0.48 crown a kilo (4.2 U. S. cents a pound), somewhat higher than the 0.46 crown a kilo (4.1 U. S. cents a pound) for herring landed in foreign ports by Swedish fishermen. (United States Consulate at Goteborg, May 18, 1960.)

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FISHERMEN HOPE TO REACH AN AGREEMENT WITH NORWAY ON 12-MILE LIMIT:

Swedish west coast commercial fishermen have hope of reaching a bilateral agreement with Norwegian authorities which will permit Swedish trawlers to fish up to 4 nautical miles off the south coast of Norway and up to a level with Lindesnes. This optimism was expressed

Sweden (Contd.):

by an official of the West Coast Fishermen's Central Association when queried by the Goteborg press about the announcement made on May 13, 1960, by the Norwegian Minister of Foreign Affairs to the effect that Norway will establish a 12-mile fishing limit.

The Swedish fishery official was also quoted as saying that the matter chiefly concerns Swedish shrimp fishermen from the northern part of the province of Bohuslan. These fishermen would lose catches valued at about 5 million crowns (about US\$965,000) yearly if they were barred from their customary fishing grounds by a Norwegian 12-mile limit.

In occasional years, Swedish fishermen also fish for sprat and herring within 12 miles from the Norwegian south coast. It is very seldom, however, that Swedish fishermen come inside the 12-mile zone off the Norwegian west coast.

The Swedish fishery representative also said that through his contact with the Norwegian fishery associations he had learned that Norwegian west and north coast commercial fishermen had pressed for a 12-mile limit. The Norwegian south coast fishermen, however, had no desire to drive Swedish fishermen from their traditional shrimp fishing grounds, the United States Consul at Goteborg reported on May 17, 1960.

* * * * *

FISHING INDUSTRY AND EUROPEAN FREE TRADE ASSOCIATION:

The Swedish fishery industry today is facing changes that may be of decisive importance to its continued development, according to the economist of the West Coast Fishermen's Central Association writing in *Svenska Vastkustfiskaren* ("Swedish West Coast Fisher"), the organ of the association.

In depicting what he terms "the muddled situation," he cites as characteristic the dissolution of the 1954 Government fishery investigation committee, the principal reason for this action be-

ing that the European Free Trade Association (EFTA) had become operative on July 1 of this year, and will affect the Swedish fishery industry to an extent which cannot yet be foreseen.

The committee, the economist says, agreed unanimously that a price regulating system for fisheries was also necessary in the future. This question, he says, will now be investigated by the Swedish Board of Agriculture, which has been commissioned by the Minister of Agriculture to examine the matter of preparing such a price regulating system, in collaboration with representatives of the fishery industry and other interested parties.

In discussing the impact of the establishment of the free trade area on Swedish fisheries, the economist cited as the most immediate consequence the circumstance that on July 1 this year the import fees for frozen fish fillets were reduced by 20 percent as well as the customs duty on canned fish, while at the same time new global contingents, intended to facilitate imports, were introduced for frozen fish fillets, spiced sprat, etc., which are not subject to any fees.

In looking ahead the economist can only envisage that the free trade area means "disturbing prospects" for the Swedish fishing industry. His fears are based mostly on the fact that the free trade area includes Sweden's two largest fish suppliers, namely Norway and Denmark.

His only solution is that the fishery industry must demand that the authorities give the industry financial compensation through price-regulating funds or appropriations of other kinds. He recalled that at the end of April this year the government submitted a proposition to the Riksdag (Congress) including an allotment of 25 million crowns (US\$4.8 million) to the regulating associations of agriculture to cover costs in connection with the reduction of certain agricultural raw material to world market prices, made necessary by EFTA. It is anticipated, he says, that further measures may be required. On behalf of the

Sweden (Contd.):

West Coast fishery industry he has discussed the question with the Board of Agriculture, but there is no result as yet, he reports.

He also points out that the Swedish fishery industry, in addition to being a member of a free trade group which includes the industry's most serious competitors, has at the same time been left standing outside the European Common Market which includes some of the industry's largest customers, principally West Germany.

will be 750 metric tons; for fishoil, 2,000 tons. Compared with the 1959 marketing year, this indicates a relatively stable production (table 1).

Exports: Slight change is indicated in Sweden's marine-oil exports, as it was estimated that Sweden would export 6,000 metric tons of whale oil in the 1960 marketing year as compared with 5,744 tons in the 1959 marketing year; 1,500 tons of fish oil in 1960 as compared with 1,471 tons in 1959 (table 2).

Imports: In 1959, the United States was Sweden's greatest single source of

Table 1 - Sweden's Supply and Disappearance of Edible Marine Oils for Marketing Years 1958/59-1959/60 (Ending August 31)

Item	Estimated 1959/60				1958/59			
	Fish-Liver Oil	Whale Oil	Fish Oil	Total	Fish-Liver Oil	Whale Oil	Fish Oil	Total
	(Metric Tons)							
Opening stocks 9/1	100	11,569	3,630	15,299	100	13,467	5,635	19,202
Production (crude only)	750	-	2,000	2,750	700	-	1,900	2,600
Imports	900	26,000	7,000	33,900	1,883	1,26,241	1,51,135	1,32,259
Total supply & disappearance	1,750	37,569	12,630	51,949	1,683	39,708	12,670	54,061
Exports	-	2,600	1,500	4,100	-	2,574	1,471	4,045
Domestic disappearance	1,650	20,525	8,000	30,175	1,583	22,395	7,569	31,547
Ending stocks 8/31	100	11,044	3,130	14,274	100	11,569	3,630	15,299

1/Distribution by types partly estimated for September-December 1958.
2/Exported as hydrogenated.

It is now evident, he says, that as early as at the turn of the year the six-state Common Market will begin building an outer customs barrier affecting herring and fish, among other things. He cannot foresee at the present time to what extent this will affect Sweden's direct landings as well as commercial exports, but it is hardly an exaggeration, he says, to characterize the prospects as disturbing.

The bright aspects of the picture, as seen by the economist, are that the Swedish fishery industry is at present undergoing a rationalization which will increase its international competitive power, and the West Coast fishermen have established powerful trade and economic organizations through which they have mediums that will look after their interests. (United States Embassy, Goteborg, report of June 1, 1960.)

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MARINE-OIL PRODUCTION, FOREIGN TRADE, AND CONSUMPTION:

Production: For the marketing year ending August 31, 1960, it is estimated that Sweden's production of fish-liver oil

marine fats and oils. This situation should continue, as a new demand has been created for oils with a high percentage of unsaturated acids and United States menhaden oil is included among them.

Table 2 - Sweden's Exports of Marine Oils by Type and Country of Destination, Calendar Year 1959

Type and Origin	Quantity Metric Tons
Herring oil, raw:	
Norway	1,890
West Germany	315
Denmark	513
Austria	10
Italy	33
Total	2,761
Other fats and oils from fish and marine-mammals:	
Belgium	8
Greece	1
Total	9
Grand total	2,770

Sweden received 16,927 metric tons of marine fats and oils from the United States in 1959. The bulk of marine fats and oils imported by Sweden in 1959 were refined products, however; considerable amounts of whale oil and herring oil were imported unrefined.

Marine-oil imports by Sweden in marketing year 1960 are expected to increase slightly.

Sweden (Contd.):

Consumption: During the 1959 marketing year ending August 31, a total of 25,689 metric tons of marine oils were used for food as compared with 5,858 tons used for technical purposes. Margarine production consumes the bulk (25,350 tons) of the marine oils in Sweden, and increased use of marine oils can be anticipated as margarine production is expected to increase by 7,000 tons in 1960. The balance of the marine oils used for food are used in baking, fat emulsions and mayonnaise, and frying fats.

Table 3 - Sweden's Imports of Marine Oils by Type and Country of Origin, Calendar Year 1959

Type and Origin	Quantity Metric Tons
Whale Oil, Raw:	
The Netherlands	956
Norway	5,102
Total	6,058
Sperm Oil, Raw:	
Norway	100
Great Britain	54
Total	154
Seal Oil, Raw:	
Norway	17
Denmark	3
Total	20
Herring Oil, Raw:	
Norway	87
Western Germany	3,755
Denmark	763
Iceland	1,647
Total	6,252
Vitaminized Oil Products:	
Norway	16
Japan	52
Total	68
Medical and Veterinary Oil:	
Norway	853
Iceland	37
Great Britain	54
Denmark	91
Total	1,035
Other Fats and Oils from Fish and Marine Mammals (Also Refined):	
Norway	654
Western Germany	3,112
Peru	488
United States	16,927
Denmark	48
Total	21,229
Grand Total	34,816

Prices: C. i. f. wholesale prices as of March 31, 1960, for crude hydrogenated whale oil were 2.30 kronor a kilogram (20 U. S. cents a pound) and for refined 2.44 kronor a kilogram (21 U. S. cents a pound). Swedish importers paid an average of 1.13 kronor a kilogram (10 U. S. cents a pound) for whale oil in 1959, and 1.08-1.13 kronor a kilogram (9.5-10.0 U. S. cents a pound) in January-

March 1960. (United States Embassy, Stockholm, April 20, 1960.)

Note: Values converted at rate of 1 krona equals US\$0.193.

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PROHIBITION ON SALES OF ICELANDIC HERRING REMOVED FOR 1960:

The Swedish Agricultural Marketing Board has announced that there will be no prohibition in Sweden against the sale of imported Icelandic herring in 1960. Such a prohibition has in previous years been in effect during a certain period in the fall in order to protect the sales of North Sea (Fladen) herring landed by Swedish fishermen.

In commenting on this action, a representative of the West Coast Fishermen's organization stated that Swedish North Sea (Fladen) fishermen do not have any complaint against competition with Icelandic herring caught by other Swedish fishermen and landed in Sweden. They do, however, consider it unwise to permit the sale of imported Icelandic herring during a period when there usually is a good supply of North Sea herring available in Sweden. He said further that the sales prohibition, that had been in effect in previous years, had favored the trade with herring, and he asserted that even dealers in salted herring are in favor of the sales prohibition. (U. S. Consulate in Göteborg, May 17, 1960.)



Thailand

COD-LIVER OIL IMPORTS INCREASE:

Imports of cod-liver oil by Thailand increased to 26,153 gallons valued at US\$35,048, in 1959 as compared with 12,945 gallons valued at US\$22,048 in 1958. Imports of other marine-animal oils in both years were valued at less than US\$1,000. The average price paid for cod-liver oil imports in 1959 was down about 21 percent from the preceding year.

The tariff duties of Thailand pertaining to fats and oils (including fish and marine animal oils), whether or not re-

Thailand (Contd.):

fined, were revised on March 3, 1960. Both an ad valorem and a specific duty now exist; the higher of the two is paid. The ad valorem rate for edible marine oils is 22 percent of the value or a specific rate of 21.1 U. S. cents a kilo (9.6 cents a pound). Inedible marine oils have an ad valorem rate of 22 percent or a specific rate of 3.2 cents a kilo (about 1.5 cents a pound).

Thailand's exports of fish and marine-animal oils are very negligible. (Foreign Agricultural Service Report, Bangkok, April 11, 1960.)



U. S. S. R.

FIRST FISH CANNING
FACTORYSHIP LAUNCHED:

On April 20, 1960, the Soviet Union's first fish canning factoryship, the Andrej Zakharov, was launched according to a report in Leningradskaja Pravda of April 21. The ship is 162 meters (531.4 feet) long and displaces 15,300 tons and will be stationed in Vladivostok. It is designed for an annual capacity of 25 million cans, 105 tons of caviar or other fish roe, and 126 tons of fish oil. (Fiskets Gang, May 19, 1960.)

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LITHUANIAN FISHERIES TRENDS,
APRIL 1960:

In 1960, the Lithuanian fisheries are scheduled to produce over 100,000 metric tons. The landings during the first quarter of 1960 indicate that this goal will be reached before the end of the year, according to a report by the Chief, Directorate for the Fishing Industry of the Lithuanian Regional Economic Council, published in Sovjetskaja Litva of April 10, 1960.

In 1959, the whole of the catch of ocean perch was landed salted. This year most of the catch will be landed frozen. Preparations for the herring fishery which begins in July are under way. Part of the fleet will go to Iceland to fish with gill nets, and another part

will trawl in the North Sea. Cod fishing will be conducted on new grounds off Greenland and in Davis Strait, and there will be trawling for herring in the Norwegian Sea. (Fiskets Gang, May 19, 1960.)



United Kingdom

WHITE FISH AUTHORITY
INCREASES INTEREST RATES ON
FISHERY LOANS AS OF MAY 13:

The British White Fish Authority, as a result of increases in the rates of interest charged to them by the Treasury, increased its rates on fishery loans on May 13, 1960.

The new rates are: On loans for not more than 5 years, $5\frac{1}{2}$ percent; increase $\frac{1}{8}$ percent. For more than five years but not more than 10 years, $5\frac{3}{4}$ percent; increase $\frac{1}{4}$ percent. For more than five years but not more than 15 years, $6\frac{1}{4}$ percent; no change. For more than 15 years $6\frac{1}{2}$ percent; increase $\frac{1}{8}$ percent.

The new rates do not apply where the final installment of a loan or interim installments in current cases were paid by the Authority before May 13. (The Fishery News, May 27, 1960.)

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PRODUCTION, IMPORTS, AND
CONSUMPTION OF WHALE
OIL, 1958 AND 1959:

Imports of whale oil by the United Kingdom decreased from 86,400 long tons in 1958 to 81,700 tons in 1959^{1/}. Britain's Antarctic whale-oil production also decreased, from 49,000 tons in 1958 to 30,500 tons in 1959. In addition, production from the Falkland Islands totaled 6,700 tons in 1958 and 6,300 tons in 1959.

British margarine consumption increased 1.6 pounds per capita in 1959 and considerably larger quantities of refined whale oil were diverted to this use—from 80,000 tons in 1958 to 91,000 tons in 1959. In 1959, 45,000 tons of whale oil were used in cooking fat, as compared with 47,000 tons in 1958.

^{1/}These figures no longer include oil produced from British whaling operations.

United Kingdom (Contd.):

The use of crude whale oil increased from 138,600 tons in 1958 to 149,700 tons in 1959. (U. S. Foreign Agriculture Service Report, London, April 14, 1960.)



Uruguay

FISH MEAL PRODUCTION EXPECTED TO INCREASE SLIGHTLY:

In 1959, Uruguay produced 900 metric tons of fish meal. It is estimated that this production will increase to 1,000 tons in 1960 and to 1,200 tons in 1961. It is expected that any increased production will be utilized domestically in animal feed. (U. S. Foreign Agricultural Service Report, Montevideo, April 13, 1960.)



SCALLOPS

Approximately 20,000 people from all parts of the country attended the Third Annual Scallop Festival at Marine Park in New Bedford, Mass., August 12, 13, and 14, 1960. Scallops are generally an exceptionally good buy. They are very nutritious--contain high levels of well-balanced protein, very little fat, and many of the minerals and vitamins so necessary for the good health of all members of the family.



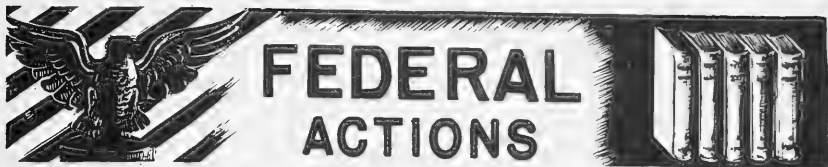
New England scallop supper.

Scallops can be served in various ways, including cocktails, appetizers, soups, salads, broiled, fried, or in combination dishes. A typical combination dish, which is both appetizing and economical, is "New England Scallop Supper," as recommended by the home economists of the U. S. Bureau of Commercial Fisheries.

NEW ENGLAND SCALLOP SUPPER

2 pounds scallops, fresh or frozen	$\frac{1}{4}$ cup flour
$\frac{2}{3}$ quarts boiling water	1 teaspoon salt
$\frac{1}{4}$ cup salt	2 cups milk
6 medium baking potatoes	1 cup cooked peas
	$\frac{1}{4}$ cup butter or other fat

Thaw frozen scallops. Remove any shell particles and wash. Place in boiling salted water. Cover and return to the boiling point. Simmer for 3 to 4 minutes, depending on size. Drain. Cut large scallops in half. Wash potatoes. Bake potatoes in a hot oven, 425° F., for 45 to 60 minutes or until soft. Melt butter; blend in flour and salt. Add milk gradually and cook until thick and smooth, stirring constantly. Stir in peas and scallops. Heat. Cut a cross in the top of the baked potatoes with a pointed knife. Squeeze the potatoes so that the interior will be exposed. Serve scallop mixture over potatoes. Serves 6.



Interdepartmental Committee on Trade Agreements

TRADE-AGREEMENT NEGOTIATIONS UNDER GATT INCLUDE FISHERY PRODUCTS:

Notice of intention of the United States to conduct trade agreement negotiations under the General Agreement on Tariffs and Trade with foreign governments which are contracting parties to that agreement and with the Governments of Israel, Spain, Switzerland, and Tunisia was published in the Federal Register of May 28, 1960.

Annexed to the notice was a list of articles imported into the United States to be considered for possible modifications of duties or other import restrictions, imposition of additional import restrictions, or specific continuance of existing customs or excise treatment in the trade agreement negotiations. Fishery products and related products are included in the list, such as marine-animal oils; netting; fish-liver oils; dressed swordfish; fish fillets and steaks; dried fish; canned smoked sardines in oil over 30 cents per pound; other specialty canned fishery products such as anchovies, fish balls, cakes, etc.; certain types of pickled or salted fish; certain types of smoked or kippered fish; etc.

Persons interested in export articles also were requested to express their views regarding any tariff or other trade concessions that might be requested of foreign governments with which negotiations are to be conducted, whether or not such articles are included in the list of export articles on which the United States is considering requesting such concessions. The list of export articles was issued May 28 by the Department of State in its Publication No. 6987. Sever-

al fishery products or related products are included in the list.

Note: See pp. 39-41 of this issue.



Committee for Reciprocity Information

TRADE-AGREEMENT NEGOTIATIONS UNDER GATT INCLUDE FISHERY PRODUCTS:

Notice for submission of information to the Committee for Reciprocity Information in regard to trade-agreement negotiations under GATT was published in the May 28, 1960, Federal Register. The notice pointed out that closing date for application to appear at the hearing and for submission of briefs was June 27. The hearing opened on July 11, 1960. Persons or groups interested in import articles were requested to present to the Committee their views concerning possible tariff concessions by the United States on any article, whether or not included in the list annexed to the notice of intention to negotiate of the Interdepartmental Committee on Trade Agreements. Persons or groups interested in export articles were also requested to present their views regarding any tariff or other trade concessions that might be requested of the foreign governments with which negotiations are to be conducted, whether or not the articles are included in the list of export articles published by the Department of State. Certain fishery products are included in both the import and export list.

Note: See pp. 39-41 of this issue.



U. S. Tariff Commission

"PERIL POINT" INVESTIGATION OF IMPORTED ARTICLES TO BE CONSIDERED IN TRADE-AGREEMENT NEGOTIATIONS UNDER GATT:

Concurrently with the announcement of the Interdepartmental Committee on Trade Agreements concerning proposed trade agreement negotiations, the President furnished the U. S. Tariff Commission a list of articles imported into the United States to be considered in the proposed trade agreement negotiations under GATT, and requested the Tariff Commission to make a "peril point" investigation and report with respect to each such article, as provided in section 3 of the Trade Agreements Extension Act of 1951, as amended. The notice of the Commission's investigation and hearings appeared in the Federal Register of May 28, 1960. The final date for filing requests to testify and written statements was June 27. The public hearings began on July 11, 1960.

The purpose of the Commission's investigation is to obtain the facts necessary to enable the Commission to formulate findings (known as "peril point" findings) for inclusion in a report to the President with respect to each article included in the President's list as to (1) the limit to which the modification of duties and other import restrictions, imposition of additional import restrictions, or specific continuance of existing customs or excise treatment may be extended in order to carry out the purpose of Section 350 of the Tariff Act of 1930, as amended (Trade Agreements Act), without causing or threatening serious injury to the domestic industry producing like or directly competitive articles, and (2) if increases in duties or additional import restrictions are required to avoid serious injury to the domestic industry producing like or directly competitive articles, the minimum increases in duties or additional import restrictions are required.

It was pointed out that oral testimony and written statements received by the Commission will be available to the Committee for Reciprocity Information, so that appearance before both the Committee and the Commission, although permissible, was not necessary. Likewise testimony and statements received by the Committee will be available to the Commission.

Note: See pp. 39-41 of this issue.

* * * * *

HEARINGS ON EFFECT OF IMPORTS OF HARD FIBER CORDS AND TWINES ON DOMESTIC INDUSTRY:

Upon application of the Cordage Institute, New York, N. Y., received June 10, 1960, the U. S. Tariff Commission, on June 24, 1960, under the authority of section 7 of the Trade Agreements Extension Act of 1951, as amended, instituted an investigation to determine whether cords and twines^{1/} provided for in paragraph 1005(b) of the Tariff Act of 1930, are, as a result in whole or in part of the duty or other customs treatment reflecting concessions granted thereon under the General Agreement on Tariffs and Trade, being imported into the United States in such increased quantities, either actual or relative, as to cause or threaten serious injury to the domestic industry producing like or directly competitive products.

A public hearing in connection with this investigation will be held on September 28, 1960, in the Hearing Room, Tariff Commission Building, Washington, D. C. Interested parties desiring to appear and to be heard at the hearing should notify the Secretary of the Commission, in writing, at least five days in advance of the date set for the hearing.

^{1/}Cords and twines (whether or not composed of three or more strands, each strand composed of two or more yarns), tamed or untamed, single or plied, wholly or in chief value of henequen, manila (abaca), sisal, or other hard fiber.



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

EFFECTIVE DATE EXTENDED FOR STATUTE FOR CERTAIN FOOD ADDITIVES:

The Commissioner of Food and Drugs, pursuant to authority provided in the Federal Food, Drug, and Cosmetic Act (sec. 6(c), Pub. Law 85-929; 72 Stat. 1788; 21 U.S.C., note under sec. 342) authorizes the use in foods of certain additives for which tolerances have not yet been established or petitions therefore denied. On the basis of data supplied and findings that no undue risk to the public health is involved and that conditions exist that make necessary the prescribing of an additional period of time for obtaining tolerances or denials of tolerances or for granting exemptions from tolerances, certain additives may be used in food under certain specified conditions for a period of 1 year from March 6, 1960, or until regulations shall have been issued establishing or denying tolerances or exemptions from the requirement of tolerances, in accordance with section 409 of the Act, whichever occurs first.

Two separate documents on this subject appeared in the June 15 Federal Register. The two documents contain an extensive list of food additives (about 250 items), mostly flavoring substances and natural substances used in conjunction with flavors. The lists give the common and botanical or zoological name of source for each substance.



Department of the Interior

FISH AND WILDLIFE SERVICE BUREAU OF COMMERCIAL FISHERIES

ALASKA REGIONAL DIRECTOR NAMED TO FILL REGIONAL FISHERIES POST IN NORTH ATLANTIC REGION:

The appointment of John T. Gharrett, Regional Director of the Bureau

of Commercial Fisheries in Alaska, as Director of the Bureau's Regional Office (Region 3) in Gloucester, Mass., was announced June 21, 1960, by Assistant Secretary of the Interior Ross Leffler.

Gharrett replaces Joseph F. Puncchar who resigned July 5 to become Director of Research for the Maine Sardine Council.

Puncchar, an employee of the Fish and Wildlife Service for a quarter of a century, has been in charge of Bureau operations in the North Atlantic Region since the office was established in 1958. In his new position, he will be located in Bangor, Maine.

Gharrett has been employed in fisheries research and management since 1940. He has been with the International Pacific Halibut Commission, Oregon State Fish Commission, Pacific Marine Fisheries Commission, and the Bureau of Commercial Fisheries. He came to the Bureau in October 1955, and was attached to Alaska activities with headquarters in Juneau.

* * * * *

PROPOSED REVISION OF PROHIBITION TO FISH FOR SALMON WITH ANY NET IN NORTH PACIFIC:

In order to provide identical coverage with that provided the Pacific Coast States, a revision was proposed of the U. S. Department of the Interior regulation prohibiting to fish for or take salmon with any net in the North Pacific. Interested persons had until July 9 to submit comments, suggestions, or objections to the proposed amendments. The proposed revision as it appeared in the June 9 Federal Register follows:

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service [50 CFR Part 130]

NORTH PACIFIC AREA

Definition; Salmon Fishery Prohibition

Notice is hereby given that pursuant to the authority vested in the Secretary of the Interior by section 12 of the act of August 12, 1954 (68 Stat. 700; 16 U.S.C. 1031), it is proposed to amend 50 CFR Part 130 as set forth below. The

purpose of the amendment is to extend the boundaries of the area where it is prohibited to fish for take salmon with any net and to define the term North Pacific area.

Such fishing has been prohibited by Federal regulations since 1957 under authority of the North Pacific Fisheries Act as far west as longitude 175 degrees west.

In order to provide identical coverage with that provided the Pacific Coast States, it is now proposed to extend the prohibition against such fishing throughout the North Pacific area.

It is the policy of the Department of the Interior whenever practicable, to afford the public an opportunity to participate in the rule making process. Accordingly, interested persons may submit written comments, suggestions, or objections with respect to the proposed amendments to the Bureau of Commercial Fisheries, Washington 25, D. C., within thirty days of the date of publication of this notice in the FEDERAL REGISTER.

(Sec. 1, 68 Stat. 698, as amended; 16 U.S.C. 1021 et seq.)

ROSS LEFFLER,

Assistant Secretary of the Interior,

JUNE 3, 1960.

Part 130—North Pacific Area, would be revised as follows:

§ 130.1 Definition.

For the purpose of the regulations of this part the North Pacific area is defined to include all waters of the North Pacific Ocean and Bering Sea north of 48 degrees 30 minutes north latitude, exclusive of waters adjacent to Alaska north and west of the International Boundary at Dixon Entrance which extend three miles seaward (a) from the coast, (b) from lines extending from headland to headland across all bays, inlets, straits, passes, sounds and entrances, and (c) from any island or groups of islands, including the islands of the Alexander Archipelago, and the waters between such groups of islands and the mainland.

SALMON FISHERY

§ 130.10 Salmon fishing prohibited, exception.

No person or fishing vessel subject to the jurisdiction of the United States shall fish for or take salmon with any net in the North Pacific area, as defined in this part: *Provided*, That this shall not apply to fishing for sockeye salmon or pink salmon south of latitude 49 degrees north.

BUREAU OF INDIAN AFFAIRS

REVISION PROPOSED OF COMMERCIAL FISHING REGULATIONS FOR RED LAKE INDIAN RESERVATION:

A proposed revision of the commercial fishing regulations for the Red Lake Indian Reservation, Minnesota, appeared in the Federal Register of May 28, 1960. The principal revisions in the regulations include application of a maximum annual quota to yellow or walleye pike,

the main species, rather than to all game fish; and prohibits the taking of yellow and northern pike (pickereel) during their spawning season except for propagation purposes. The remaining revisions are primarily for the purpose of clarification and to eliminate functions of the Red Lake Fisheries Association from the regulations.

Interested persons had until June 27, 1960, to submit comments, suggestions, or objections.

* * * * *

ALASKAN INDIAN COMMERCIAL FISHING REGULATIONS, 1960:

Regulations have been issued by the Bureau of Indian Affairs of the U. S. Department of the Interior to perpetuate certain fishing rights long recognized by Federal statutes, regulations, and custom and secured to the Alaska Eskimos, Indians and Aleuts by section 4 of the Alaska Statehood Act of July 7, 1958. The regulations were published in the June 2, 1960, Federal Register and became effective on the date of publication.

The proposed regulations appeared in the April 9, 1960, Federal Register. Interested persons were given an opportunity to submit their views, data, or arguments in writing, to the Bureau of Indian Affairs by May 9, 1960. Several comments regarding the proposed regulations were received. They dealt mainly with the sections providing for the authorization of fish trap operation by three native communities of Kake, Angoon, and Metlakatla, and the declaration of an exclusive fishery at the Karluk Reservation. Written comments, suggestions, and objections were considered. In addition, in response to their request to be heard, an opportunity was extended to seven Alaska cannery operators in Kodiak Island to orally present their view on the proposed regulations pertaining to the Karluk Reservation. Further, the views of the native inhabitants of the Karluk Reservation were sought as to their plans and desires for the utilization of reservation waters for the 1960 fishing season.

The regulations revise and clarify the language of the section on restrictions on Indian traps pertaining to the locations and periods in which traps may be operated. The wording in § 82.2(a) as published would allow the operation of Indian traps at any time fishing was allowed by the State in the established fishing section in which the traps are located or at any time fishing was allowed in the adjacent district. The newly-proposed wording would key the trap fishing season in each section to the periods in which purse-seine fishing is permitted by the State in the respective sections, with one exception. In the case of Metlakatla traps the fishing season would be keyed to the purse-seine fishing season in the Southeast Section of Clarence Strait, and also to the seining season in the adjacent general section of the Southern District, since relatively little purse-seining is conducted in the South East Section of Clarence Strait.

The section on commercial fishing on the Karluk Indian Reservation has revised language in accordance with comments received from the natives of Karluk Reservation and others, to provide that the waters of the Karluk Indian reservation shall be open to native inhabitants of the village of Karluk and vicinity and to other persons insofar as the fishing activities of the latter do not restrict or interfere with fishing by such natives. Further, the newly-worded section provides for the use of beach seines up to 250 fathoms in length by natives and, prior to July 1, for their fishing up to within 100 yards of the mouth of the Karluk River.

The regulations as published include sections on scope; restrictions on Indian fish traps, size and operation of Indian salmon traps; definition Karluk Indian Reservation; commercial fishing, Karluk Indian Reservation; commercial

salmon fishing by native Indians in the Yukon and Kuskokwim Rivers; personal use fishing by native Indians; modification of regulations; and enforcement.



Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISION

INTERPRETATION OF FISHERIES INDUSTRIES EXEMPTIONS UNDER FAIR LABOR STANDARDS ACT DEFENDED:

The Department of Labor's interpretation of exemptions from the Fair Labor Standards Act for employees in the fishery and seafood industries was contained in an interpretative bulletin issued by the Administrator of the Department's Wage and Hour and Public Contracts Division. Two exemptions are interpreted. One is a minimum-wage and overtime pay exemption for workers employed in catching, processing, distributing, and performing other specified operations on fish and other aquatic products. The other exemption is one from the overtime-pay provisions—but not the minimum-wage requirements—applying to workers employed in canning fish and other aquatic products.

In response to a letter from Senator Byrd of Virginia protesting the Department's interpretation of the fishery industries exemptions, Acting Secretary of Labor James O'Connell wrote:

"This is in reply to your letter of May 31, 1960, in which you state it is your opinion that the fishery and seafood exemptions contained in the Fair Labor Standards Act apply to the entire industry and that the Department's interpretative Bulletin, Part 784, giving a more limited scope to the exemptions should be rescinded and inspections of seafood plants should be stopped.

"The Interpretative Bulletin, referred to, was issued after careful study and with a full awareness of the views of the members of the seafood industry. The Department feels that the position taken therein, namely that the exemptions (Sections 13(a)(5) and 13(b)(4)) are limited to the enumerated employee activities is supported by the language of the exemptions, the legislative history and pertinent court decisions. The Court of Appeals for the First Circuit in arriving at the same conclusion in the case of *Mitchell v. Calvin Stinson d/b/a Stinson Canning Company*, 217 F(2) 210, predicated its decision on the aforesaid grounds.

"In view of the foregoing, and having in mind the admonition of the Supreme Court of the United States that exemption from this humanitarian Act must 'be narrowly construed' and applied only to those 'plainly and unmistakably within its terms and spirit' (*Phillips Co. v. Walling*, 324 U.S. 490) and that exemption should not be enlarged by implication (*Addison v. Holly Hill Co.*, 322 U.S. 607), I do not feel there is justification for adopting the courses of action you recommend."

Note: Also see *Commercial Fisheries Review*, April 1959 p. 98.



Department of the Treasury

FISH BLOCKS FROM ICELAND NOT SOLD AT LESS THAN FAIR VALUE:

Fish blocks from Iceland are not being sold in the United States at less than fair value, according to a determination of the Department of the Treasury pub-

lished in the Federal Register of June 15. The finding was as follows:

DEPARTMENT OF THE TREASURY

Office of the Secretary

[AA 643.3]

FISH BLOCKS FROM ICELAND

Determination of No Sales at Less Than Fair Value

JUNE 9, 1960.

A complaint was received that fish blocks from Iceland were being sold to the United States at less than fair value within the meaning of the Antidumping Act of 1921.

I hereby determine that fish blocks from Iceland are not being, nor are likely to be, sold in the United States at less than fair value within the meaning of section 201(a) of the Antidumping Act, 1921, as amended (19 U.S.C. 160(a)).

Statement of reasons. The fish blocks in question were imported by a subsidiary of the foreign seller and were not resold in the United States in their imported condition, being further processed by the importer into fish portions, fish sticks, and similar products. Under these circumstances, exporter's sales price, which is the applicable basis of comparison, does not exist and the Antidumping Act has no application.

This determination and the statement of reasons therefore are published pursuant to section 201(c) of the Antidumping Act, 1921, as amended (19 U.S.C. 160(c)).

[SEAL]

A. GILMORE FLUES,
Acting Secretary of the Treasury.

UNITED STATES CUSTOMS COURT

WHALE-LIVER OIL IMPORTS CLASSIFIABLE AS ADVANCED DRUG:

Certain imports of whale-liver oil extracted from whale livers to obtain vitamin "A" oil, with the extraction made in the country of exportation, were held properly classifiable under paragraph 34, Tariff Act of 1930, as modified by the General Agreement on Tariffs and Trade (T. D. 51802) at the rate of 5 percent ad valorem as a drug, "advanced" in value or condition, as classified, rather than free of duty under paragraph 1669 of the said act, as modified by T. D. 51802, supra, as a "crude" drug. The decision held that the whale-liver oil was "advanced in value or condition," by certain processes beyond that essential to the proper packing of the drug and the prevention of decay or deterioration pending manufacture. The judgment was rendered on May 24, 1960, in the case *Alaska Fish Oil Extractors, Inc. v. United States (Whale Liver Oil--Crude drug--Advanced drug)*, and published (C. D. 2179) in Treasury Decisions of June 2, 1960.

The Plaintiff contended that the oil in question is the "crudest" form of the drug imported into the United States and that any grinding or other process applied to the drug prior to importation was essential to the separation of the "drug" from the whole liver for the proper packing and the prevention of decay or deterioration of the drug pending manufacture.

On the other hand, the Government maintained that the imported oil represents an advancement over the liver "which is the crude drug," and that the processing of the whole "livers" to obtain the whale-liver "oil" in the case under consideration is essentially the same type of processing as took place in the case of fish livers previously under consideration by the Customs Court and the Appellate Court. See *Geo. S. Bush & Co., Inc., et al. v. United States*, 42 C.C.P.A. (Customs) 190, C.A.D. 592; *Eastman Kodak Company v. United States*, 41 C.C.P.A. (Customs) 114, C.A.D. 539; *Geo. S. Bus & Co., Inc. v. United States*, 32 C.C.P.A. (Customs) 56, C.A.D. 2851 *Wilbur-Ellis Company v. United States*, 27 Cust. Ct. 317, Abstract 55884; and *Ralston Purina Company v. United States*, 40 Cust. Ct. 407, Abstract 61435, in all of which cases the involved merchandise was held to be drugs, "advanced."



U. S. Supreme Court

RULES ON CASE WHICH AFFECTS USE OF FISH TRAPS BY INDIAN COMMUNITIES IN ALASKA:

The United States Supreme Court handed down a decision on June 20, 1960, in *Metlakatla Indian Community vs. Egan* and the two cases related to it. By a 6 to 3 decision, the Court announced that it would refrain from deciding the issues presented to it on their merits in order to afford the Alaska Supreme Court the opportunity to rule on the questions open to it for decision.

In the meantime, the stay ordered by Justice Brennan on July 11, 1959, is continued in force until the final disposition of the three cases. This means that the

three Indian communities will continue to use the fish traps authorized by regulations issued by the Secretary of the Interior for the 1960 season at least.

The decision recognizes the questions of Federal law but indicates the Court would prefer to decide these questions after having an interpretation of the State law involved by the State Supreme Court.

The three dissenting Justices were of the view that the controlling questions in the cases were Federal in nature and were opposed to remitting the parties to the Alaska Supreme Court.



White House

PRESIDENT APPOINTS UNITED STATES MEMBERS TO NEW SHRIMP CONSERVATION COMMISSION:

The White House announced on April 20, 1960, that the President had on that date appointed the following to be members of the United States section of the Commission for the Conservation of Shrimp in the Eastern Gulf of Mexico: John C. Ferguson, President, St. George Packing Co., Fort Myers, Fla.; Robert M. Ingle, Director of Research, Florida State Conservation Commission; and Donald L. McKernan, Director, Bureau of Commercial Fisheries, U. S. Department of the Interior.

The Commission was established pursuant to a Convention for the Conservation of Shrimp with Cuba signed on Aug. 15, 1958.

* * * * *

UNITED STATES COMMISSIONER APPOINTED TO INTER-AMERICAN TROPICAL TUNA COMMISSION:

The White House on April 22, 1960, announced the appointment of Dr. J. Lawrence McHugh, Chief, Division of Biological Research, U. S. Bureau of Commercial Fisheries, as a United States Commissioner on the Inter-American



Dr. J. Lawrence McHugh

Tropical Tuna Commission, vice Arnie J. Suomela who resigned from this post because of the press of other duties.



Eighty-Sixth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported.

Introduction, referral to committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.



The two Houses of Congress adjourned on July 3, 1960. The Senate will reconvene on August 8, 1960, and the House of Representatives will reconvene on August 15, 1960.

APPROPRIATIONS CARRYOVER RESOLUTION: H. J. Res. 778 (Cannon), introduced in the House on July 1, 1960, a joint resolution making temporary appropriations for the fiscal year 1961, and for other purposes; to the Committee on Appropriations; was passed by the House and signed by the Speaker, and sent to Senate for consideration. The resolution was passed by the Senate on July 1, and signed by the Acting President pro tempore. This joint resolution makes temporary appropriations for the months of July and August. Resolution covers a number of appropriation bills, among which are H. R. 12326, Public Works Appropriation Act, 1961--which includes funds for Fish and Wildlife studies regarding fishways, etc., and lower Columbia River fish sanctuary program; and H. R. 11666, Departments of State and Justice, the Judiciary, and Related Agencies Appropriation Act, 1961--which includes, in State Department Appropriations, funds for the international fisheries commissions, of which there are nine with the inclusion of the Tortugas Shrimp Commission. As these and other appropriation bills are signed by the President, the joint resolution will have no application, as it is intended only for carryover purposes.

AREA ASSISTANCE ACT OF 1960: H. R. 12812 (Moore), introduced in the House on June 24, 1960, a bill to assist areas to develop and maintain stable and diversified economies by a program of financial and technical assistance and otherwise, and for other purposes to the Committee on Banking and Currency. This legislation provides that the Federal Government shall, in cooperation with the States,

help areas of substantial and persistent unemployment to take effective steps in planning and financing their economic development; shall enable communities to achieve lasting improvement and decrease economic vulnerability by the establishment of a stable and diversified local economy; and that new employment opportunities should be created rather than merely transferred from one community to another.

This bill is similar to S. 722, a bill which was, passed by both houses of Congress, and vetoed by the President on May 13, 1960. Congress on May 24, 1960, failed to over-ride the Presidential veto.

AREA REDEVELOPMENT ACT OF 1960: H. R. 12854 (Flood), introduced in the House on June 28, 1960, a bill to promote the redevelopment of economically depressed areas by establishing a Government corporation which will provide a secondary market for industrial mortgages covering property in those areas; to the Committee on Banking and Currency.

CHEMICAL PESTICIDES COORDINATION ACT: S. Report No. 1601, Cooperation in the Use of Pesticides and Other Such Chemicals (June 16, 1960, 86th Congress, Second Session, Report of the Committee on Interstate and Foreign Commerce, to accompany S. 3473), 8 pp., printed. This bill, if enacted, is to be cited as the Chemical Pesticides Coordination Act. It is designed to avert the serious and unnecessary losses of fish and wildlife that have occurred as a result of the wide use of pesticides. Before programs involving the use of pesticides or other chemicals designed for mass biological controls are initiated or financed by agencies of the Federal Government, the initiating agency would be required to consult with the U. S. Fish and Wildlife Service and state wildlife agencies exercising administration over wildlife resources in states affected by the program. The legislation would provide that the U. S. Fish and Wildlife Service advise agencies consulting with it of damages which might result from any proposed program. In the event that agencies failed to take action recommended by the Fish and Wildlife Service, the Service must report the failure to the Congress for referral to the appropriate committees. The bill would authorize the Secretary of the Interior to exempt by regulation chemicals which would cause little or no damage by their use. The bill would provide that any Federal department or agency, in submitting requests to the Congress for appropriations for programs involving the use of chemicals for eradication or control of any animal or plant pest, shall include a full description of the proposed program, including the comments and recommendations of the U. S. Fish and Wildlife Service. Report discusses purpose and need for the legislation; presents Committee amendments and reports from the departments of Interior, Agriculture, and Health, Education and Welfare. Committee reported favorably on the bill with amendments.

The Senate on June 18, 1960, passed over S. 3473 (Magnuson), a bill introduced in the Senate on May 3, 1960, to provide for advance consultation with the Fish and Wildlife Service and with State wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls.

The Senate on June 24, agreed to the removal from the calendar and referred to the Committee on Agriculture and Forestry for study, S. 3473.

COLOR ADDITIVES IN FOODS: Color Additives (Hearings before the Committee on Interstate and Foreign Commerce, House of Representatives, 86th Congress, Second Session, on H. R. 7624 and S. 2197, January 26, 27, 29, February 10, 11, March 11, April 5, 6, and May 9, 1960), 614 pp., printed. The purpose of these bills is to provide a scientifically sound basis for listing the colors that may be safely used in foods, drugs, and cosmetics; and to provide for other safeguards in the use of such colors, including, where necessary, appropriate tolerance limitations on the amount of color that may be used. The bills also would provide for a continuation of the present system of certifying the safety of individual batches of the so-called coal tar colors and would extend this system, where necessary, to natural colors not now covered by the certification system. They would, on the other hand, permit an exemption of any listed color from the certification requirement where certification is not necessary for the protection of the public health. Contains the text of both bills, reports on the bills from the Agriculture Department and the Bureau of the Budget, and statements from Federal officials, members of Congress, and businessmen.

On June 20, 1960, the House considered, under suspension of the rules, H. R. 7624 (Harris), a bill introduced in the House on June 9, 1959, to protect the public health by amending the Federal Food, Drug, and Cosmetic Act so as to authorize the use of suitable color additives in or on foods, drugs, and cosmetics, in accordance with regulations prescribing the conditions (including maximum tolerances) under which such additives may be safely used; debate to be limited to 2 hours.

On June 25, 1960, by a voice vote, the House adopted committee amendments and passed H. R. 7624. This passage was subsequently vacated and S. 2197 (Hill and Goldwater), a similar bill introduced in the Senate on June 17, 1959, was passed in lieu after being amended to contain the House-passed language. H. Res. 559, the rule under which the legislation was considered, had been adopted earlier by a voice vote.

Bill was cleared for the President's signature on June 30, when the Senate concurred with House amendment to S. 2197.

On July 1, 1960, a motion was made in the Senate to reconsider action of June 30, in which the Senate concurred with House amendment to adopt S. 2197 in lieu of H. R. 7624, and cleared bill for signature of President. The Senate tabled the motion to reconsider.

On July 12, 1960, the President signed S. 2197 into public law (P. L. 86-618). The legislation would expedite the testing of colors to determine safe levels of use by requiring color manufacturers to do the appropriate research and to submit the results to the Food and Drug Administration. All types of color additives would be subject to the safety requirements of the new law, not merely "coal-tar-colors" as under present regulations. Amends the Federal Food, Drug, and Cosmetic Act and authorizes Food and Drug Administration to list the color additives which may be used in foods.

COMMERCIAL SPONGE INDUSTRY RELIEF:

H. R. 12934 (Cramer), introduced in the House on July 1, 1960, a bill to prohibit the importation into the United States of commercial sponges measuring less than 5 inches in diameter; to the Committee on Ways and Means. This legislation is to prohibit the buying of foreign sponges under 5 inches in diameter, as they are competing unfairly with the American sponge industry. The American sponge industry is prohibited the taking of sponges less than 5 inches in diameter, while imports of sponges that size and smaller are permitted to enter the United States.

FISH AND WILDLIFE COOPERATIVE RESEARCH TRAINING UNITS: On June 24, 1960, the House passed over without prejudice S. 1781, a bill to facilitate cooperation between the Federal Government, colleges and universities, the states, and private organizations for cooperative unit programs of research and education relating to fish and wildlife. Would authorize the U. S. Fish and Wildlife Service and other agencies of the Department of Interior to enter into cooperative agreements for conducting research, training, and demonstrational programs. This bill passed the Senate on May 4, 1960.

FISH HATCHERIES: H. Rept. 1784, Orangeburg County, S. C., Fish Hatchery (June 9, 1960, 86th Congress, Second Session, report from the Committee on Merchant Marine and Fisheries, to accompany S. 2053), 3 pp., printed. The purpose of the bill is to provide for a needed increase in facilities for the production of warm water fish in South Carolina. This would be accomplished by accepting title by the Secretary of the Interior to an existing hatchery facility owned by Orangeburg County, S. C., and its development by the Fish and Wildlife Service. Background and need for this legislation is contained in the report. Development costs and property acquisition would require the expenditure of \$290,000, annual operating costs would be approximately \$30,000. Contains report of the Department of the Interior, with excerpts of an opinion of the Bureau of the Budget.

The House passed on the call of the Consent Calendar and cleared for the President on June 24, 1960, S. 2053, a bill to provide for the acceptance by the United States of a fish hatchery in the State of South Carolina. This bill was passed by the Senate on August 19, 1959.

S. 2053, was signed by the Speaker of the House, and sent to the President, on June 27, 1960.

On July 5, the President signed S. 2053 into public law (P. L. 86-572). Bill provides authority for the Secretary of the Interior to accept by donation on behalf of the United States, title to the Orangeburg County, S. C., fish hatchery, together with rights to take adequate water from Orangeburg County Lake therefor.

FISHING VESSEL MORTGAGE INSURANCE:

H. Rept. 1785, Relating to Vessel Mortgage Insurance Functions Transferred to the Secretary of the Interior (June 9, 1960, 86th Congress, Second Session, Report of the Committee on Merchant Marine and Fisheries, and committed to the Committee of the Whole House on the State of the Union, to accompany S. 2481), 6 pp., printed. The purpose of the bill is to make the program of mortgage insur-

ance on fishing vessels effective. Originally, authority to grant mortgage insurance on fishing vessels as well as merchant vessels reposed in the Secretary of Commerce. However, pursuant to the provisions of the Fish and Wildlife Act of 1956, jurisdiction over insurance on fishing vessels was transferred to the Secretary of the Interior. This jurisdiction over fishing vessel mortgage insurance did not authorize the Secretary of the Interior to draw on the Treasury to the extent that the premium fund proved inadequate, which would be likely in the early stages of the program. This bill would give the Secretary of the Interior the same authority as is possessed by the Secretary of Commerce to draw upon the Treasury to make payments on defaults of insured mortgages. Report gives background and need of legislation, and presents statements from several Federal officials. Committee recommended passage of the bill without amendment.

The House passed on the call of the Consent Calendar and cleared for the President on June 24, 1960, S. 2481, a bill to continue the application of the Merchant Marine Act of 1936, as amended, to certain functions relating to fishing vessels transferred to the Secretary of the Interior. Would create a Federal Fishing Vessel Mortgage Insurance Fund which shall be used by the Secretary of the Interior as a revolving fund for the purpose of carrying out the ship mortgage provisions as it applies to fishing vessels under the Fish and Wildlife Act of 1956. Further provides that if at any time funds are not sufficient to pay any amount the Secretary of the Interior is required to pay on ship mortgage insurance on fishing vessels, notes or other obligations may be issued to the Secretary of the Treasury as may be necessary. This bill was passed by the Senate September 11, 1959.

S. 2481, was signed by the Speaker of the House, and sent to the President, on June 27, 1960. The President signed the bill on July 5, 1960 (P. L. 86-577).

Public Law 86-577
86th Congress, S. 2481
July 5, 1960

AN ACT

74 STAT. 314.

To continue the application of the Merchant Marine Act of 1936, as amended, to certain functions relating to fishing vessels transferred to the Secretary of the Interior, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in order to fishing vessels, permit the efficient execution of functions relating to the issuance of mortgage insurance Federal ship mortgage insurance on fishing vessels, pursuant to the Merchant Marine Act of June 29, 1936, as amended (49 Stat. 2885; 46 U.S.C. 1959 edition, sec. 1271, and the following), which functions relating to fishing vessels have been transferred to the Secretary of the Interior pursuant to the Fish and Wildlife Act of 1956, the Secretary of the Interior hereafter may exercise authority comparable to the authority of the Secretary of Commerce under the said Merchant Marine Act of 1936, including, but not limited to, the authority contained in the amendment to such Act of July 15, 1959 (72 Stat. 558), as if such Act were amended to read as follows: Approved July 5, 1960.

FOREIGN COMMERCE STUDY (U. S. Trade and Common Market) (Hearings before the Committee on Interstate and Foreign Commerce, United States Senate, 86th Congress, Second Session, May 9 and 10, 1960), 298 pp., printed. This report discusses the effect regional trade groupings will have on our exports, specifically in the Common Market area of Europe as well as the European free trade area. The report contains, among others, statements from officials of international business concerns, international trade organizations, nationwide industry committees, international chambers of com-

merce, etc. Also contains a variety of exhibits, among which are exhibits on United States exports and imports; hourly wage charts of various countries, and United States investments in foreign business. A section of the report is entitled "The European Common Market and the European Free Trade Association--Their Significance to United States Business," a lucid report submitted to the United States Senate Committee on Interstate and Foreign Commerce by the Chase Manhattan Bank. Covers all aspects of the two groups of countries that have signed treaties establishing certain bonds between them: the six-nation European Economic Community (comprising France, West Germany, Italy and the Benelux countries of Belgium, Luxembourg, and the Netherlands), and the seven-nation European Free Trade Association (comprising Austria, Switzerland, Portugal, Denmark, Norway, Sweden, and the United Kingdom). Also contains a list of companies with new operations in Western Europe during 1958-1959 (since the start of the European Common Market).

HAWAII OMNIBUS ACT AMENDMENTS: The Senate Committee on Interior and Insular Affairs on June 24 reported out (S. Rept. No. 1681), with amendments H. R. 11602 (Inouye), a bill to amend certain laws of the United States in light of the admission of the State of Hawaii into the Union.

S. Rept. No. 1681, **Hawaii Omnibus Bill** (June 24, 1960, Report of the Committee on Interior and Insular Affairs, to accompany H. R. 11602), 53 pp., printed. This legislation is a necessary measure to make complete and perfect the admission of Hawaii into the Union on a free and equal footing with the other 49 States. It amends a number of acts of Congress, some merely technically, such as changing the phraseology in a statute from "Territory of Hawaii" to "State of Hawaii." Other Federal laws are amended substantively, primarily to equalize Federal activities in the new State, especially with respect to grant-in-aid programs. Section 11 contains perfecting amendments to the statute, codified at 16 U. S. C. 758-758d, which authorizes the Secretary of the Interior to undertake exploration, investigation, development, and maintenance projects for fishery resources in the Pacific. Inappropriate references to the "Territory" of Hawaii and to the "Hawaiian Islands" would be deleted or modified by the amendments. Section 12 provides a perfecting amendment to section 2(d) of the Fish Restoration Act (16 U. S. C. 777a(d)), to remove the definition of the term "State." The term is defined by existing law to include the States and the territory of Hawaii. The report discusses the purpose and background of the bill, committee amendments, cost, and maintenance of existing arrangements. Also presents a section-by-section analysis and changes in existing law. The Committee reported favorably on the bill with amendments.

H. R. 11602 with amendment was sent back to the House on June 28, 1960.

On June 30, 1960, the House adopted H. Con. Res. 706, authorizing the making of certain corrections in the enrolling of H. R. 11602.

On July 2, 1960, the Vice-President announced that he had signed H. R. 11602 and on July 5, H. R. 11602 was presented to the President for signature.

On July 12, 1960, the President signed H. R. 11602 into public law (P. L. 86-624). The purpose of this legislation is to "gather up the loose ends" in Federal legislation involved in the transition of Hawaii from a territory to a state of the United States; will make technical changes in our national laws to make Hawaii a full and equal partner with the other 49 states. One section contains perfecting amendments to the statute, which authorizes the Secretary of the Interior to undertake exploration, investigation, development, and maintenance projects for fishery resources in the Pacific. Inappropriate references to the "Territory" of Hawaii and to the "Hawaiian Islands" would be deleted or modified by the amendments.

IMPORTED COMMODITY LABELING: H. R. 5054 (Herlong), was reported out of the Senate Committee on Finance on June 27, 1960 (S. Rept. No. 1747), a bill to amend the Tariff Act of 1930 with respect to the marking of imported articles and containers. This bill passed the House on February 3, 1960.

S. Rept. 1747, Marking of New Packages for Imported Articles (June 27, 1960, 86th Congress, Second Session, Report of the Committee on Finance, to accompany H. R. 5054), 5 pp., printed. The purpose of this legislation is to amend section 304 of the Tariff Act of 1930, as amended, to provide that when articles, imported in containers required to be marked, are repackaged in the United States and offered for sale, the new package shall be marked with the name of the country of origin. Imported items which are processed in this country sufficiently to become an American manufacture are not included within the purview of the legislation and would not be affected. The committee reported the bill favorably with amendment and recommended that it pass. The report contains changes in existing law.

On July 2, 1960, the Senate passed with an amendment, in which the concurrence of the House was requested, H. R. 5054. The principle of the legislation is that items which are simply repackaged in the U. S. from bulk containers to consumer containers should continue to indicate the origin of the imported articles. Imported items which are processed in this country sufficiently to become an American manufacture (such as fish sticks from fish blocks and breaded shrimp from raw shrimp), are not included within the purview of the legislation and would not be affected. The Senate amendment, which had been recommended by the Finance Committee, provides that, "This subsection shall not apply in cases where the Secretary of the Treasury finds that compliance with the marking requirements of this subsection would necessitate such substantial changes in customary trade practices as to cause undue hardship and that repackaging of the article in question is otherwise than for the purpose of concealing the origin of such article."

INCOME TAX LAW REVISION IN FAVOR OF FISHERMEN: H. R. 1925 (King of Calif.), introduced in the House on January 9, 1959, a bill to extend to fishermen the same treatment afforded farmers in relation to estimated income tax; was reported out of the Committee on Ways and Means on June 28, 1960 (H. Rept. No. 2016).

INCOME TAX LAW REVISION IN FAVOR OF FISHERMEN: H. Rept. No. 2016, Declaration of Estimated Income Tax by Fishermen (June 28, 1960, 86th Congress, Second Session, Report from the Committee on Ways and Means, to accompany H. R. 1925), 5 pp., printed. This legislation provides that, for purposes of the estimated income tax, fishermen are to be accorded the same treatment as presently is available for farmers. Under the amendment this is to be provided for taxable years beginning after December 31, 1960. The principal advantage for income from farming which the bill extends to income from fishing is the privilege of filing the declaration of estimated tax, and paying the estimated tax, by January 15 after the end of the year in question (in the case of a calendar-year taxpayer), rather than filing the declaration by the prior April 15 and making quarterly payments of estimated tax largely during the year. This bill has been reported unanimously by the committee. The report includes a general statement regarding payment of the estimated tax, and the changes in existing law.

On June 29, 1960, H. R. 1925, was read three times, passed by the House, and sent to the Senate.

INTERNATIONAL FISHERIES ORGANIZATIONS: United States Contributions to International Organizations, House Document No. 418, 86th Congress, 2nd Session (Letter from the Acting Secretary of State, dated June 17, 1960, transmitting the eighth report on the extent and disposition of U. S. contributions to international organizations for the fiscal year 1959, pursuant to section 2 of public law 806, 81st Congress), 133 pp., printed. Each year the Secretary of State reports on the extent and disposition of financial contributions by the United States to International Organizations of which it is a member. This is the eighth such report to Congress, and covers United States contributions for the fiscal year 1959. Only the multi-lateral organizations and programs to which the United States contributes are included. Bilateral commissions have been excluded. This document gives a brief outline of the history of each such commission: secretary or director; term of office, origin and development; initial date of United States participation; current authority for United States participation; purpose of organization; United States contribution; and the governing body. Among the fishery commissions mentioned are the Inter-American Tropical Tuna Commission; International Commission for the Northwest Atlantic Fisheries; International Whaling Commission; and the North Pacific Fur Seal Commission.

LAW OF THE SEA CONVENTIONS: On July 2 Senator Long of Louisiana sent to the Senate desk a reservation to the ratification of the Optional Protocol of Signature Concerning the Compulsory Settlement of Disputes, which originated at the Law of the Sea Conference held at Geneva in 1958. The Senate on May 26 approved resolutions of ratification of the four conventions which also were the result of the Geneva Conference, and at the same time rejected ratification of the Optional Protocol on the grounds that it failed to include the so-called Connally reservation. The motion to reconsider the unfavorable vote entered by Senator Mansfield of Montana on May 27 is still pending before the Senate. The reservation ordered by Senator Long

is similar to the Connally reservation in that it reserves to the United States the authority to decide what matters are essentially within the domestic jurisdiction of the United States and thus not to be referred to the International Court of Justice.

MARINE SCIENCES SPECIAL COMMITTEE: H. R. 12700 (Brooks of Louisiana), introduced in the House on June 17, 1960, a bill to amend the National Science Foundation Act of 1950 to create a Special Committee on Marine Sciences, to develop and encourage a national program for the promotion of research, surveys, and education in the marine sciences, to recommend contracts, grants, or other forms of assistance, to encourage the cooperation of agencies and evaluate the programs of marine research undertaken by agencies of the Federal Government in these scientific fields; referred to the Committee on Science and Astronautics. The bill would appropriate \$37.2 million for marine research operations by the Foundation for 10 years.

OCEANOGRAPHIC RESEARCH PROGRAM: H. Rept. No. 2078, Ocean Sciences and National Security (Report of the Committee on Science and Astronautics, U. S. House of Representatives, 86th Congress, Second Session, Serial h), 180 pp., printed. Contains tables, summaries of studies various government agencies are making on oceanography, and a list of congressional bills which relate to oceanography, their preambles, and in some instances, pertinent sections of the bills are included. The Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, is responsible for extensive programs in support of all types of fishery interests, including particularly biological aspects of oceanography, and these are also discussed in the report. The Bureau maintains a number of laboratories for the purpose of studying those characteristics of the ocean which affect fish and fishing, and the report summarizes their work in the following fields: (1) Plankton sampling; (2) Behavior of marine animals; (3) Artificial cultivation of young fish and shellfish; (4) Distribution of marine populations; (5) Biological surveys and inventories of the ocean; (6) Taxonomy of marine species; (7) Genetics of marine organisms; (8) Pond fish culture, brackish water farming; (9) Effects of industrial and domestic waste on estuaries; (10) Study of disease and parasites and their effects in marine ecology; (11) Transplantation of organisms; (12) The potential of artificially increasing nutrients; (13) The utilization of new marine products; (14) The improvement of fishing techniques and equipment; and (15) The economy and legal aspects of commercial fisheries. The report further inventories the existing capabilities in oceanographic research, in terms of universities and other laboratories undertaking oceanic research, manpower, the size and sources of funds especially from Federal agencies, including the manner in which Federal programs from some 19 different agencies are integrated; and, finally, the manner in which the United States participates in international programs. The three different 10-year plans are abstracted, compared, and analyzed. The Committee adopted and approved the report on June 30, 1960.

Oceanography (Hearings before the special Subcommittee on Oceanography of the Committee on

Merchant Marine and Fisheries, House of Representatives, 86th Congress, Second Session on H. R. 9361, H. R. 10412, and H. R. 12018, May 17, 18, 19, 20, 24, and 25, 1960), 217 pp., printed. This legislation is designed to foster a program for the establishment of an effective, coordinated national oceanographic program. Contains the text of the three oceanographic bills, and statements and testimony of various oceanographers, geologists, zoologists, marine biologists, government officials, and members of various fisheries commissions.

S. Rept. No. 1525, Marine Sciences and Research Act (June 7, 1960, 86th Congress, Second Session, Report of the Committee on Interstate and Foreign Commerce, to accompany S. 2692), 64 pp., printed. The primary purpose of the bill is to enhance the national economy, security, and welfare by increasing our knowledge of the oceans and the Great Lakes in all pertinent scientific fields, such as physics, biology, chemistry, meteorology, and geology. To speed this objective, the bill is designed to approximately double, within the next 10 years, the capabilities of the United States to conduct a balanced, comprehensive program of marine research and surveys. This program would consist of (1) a national policy of continuous and constructive scientific studies of the waters of our national boundaries; (2) educate and train additional marine scientists in adequate numbers; (3) construct and operate new and advanced research ships, laboratories, equipment, etc.; (4) coordinate oceanographic and limnological activities of the various Federal departments and agencies participating in the program; and (5) International and interdepartmental exchange of oceanographic data. Report discusses need, explains, and presents a section-by-section analysis of the bill. Also includes the reports submitted by the Budget Bureau, Comptroller General, and the departments of Commerce, Navy, Interior, Treasury, and Health, Education and Welfare; as well as the National Science Foundation. Committee reported favorably on the bill with amendments.

OCEANOGRAPHIC RESEARCH PROGRAM: The Senate on June 18 passed over as not appropriate for calendar action, S. 2692 (Magnuson), a bill to advance the marine sciences, to establish a comprehensive 10-year program of oceanographic research and surveys; to promote commerce and navigation; to secure the national defense; to expand ocean resources; to authorize the construction of research and survey ships and facilities; to assure systematic studies of effects of radioactive materials in marine environments; to enhance the general welfare, and for other purposes.

Senate on June 23, 1960, passed S. 2692 (Magnuson), a bill to advance the marine sciences, to establish a comprehensive 10-year program of oceanographic research and surveys, to promote commerce and navigation, to secure the national defense, to expand ocean, coastal, and Great Lakes resources, to authorize the construction of research and survey ships and facilities, to assure systematic studies of effects of radioactive materials in marine environments, to enhance the general welfare, and for other purposes. As passed, the bill authorizes work to be done by the National Science Foundation, the Bureau of Commercial Fisheries and the Bureau of Mines of the Department of the Interior, the Department of Commerce, and

Atomic Energy Commission, Department of the Navy, Department of the Army, Smithsonian Institute, and the Department of Health, Education, and Welfare. Motion to reconsider passage was tabled.

Bill authorizes \$534,382,485 over 10 years, of which \$170,840,000 would be for a new Division of Marine Sciences to be established by the National Science Foundation to coordinate the program, \$60,555,000 for Atomic Energy Commission to control and monitor radioactive waste disposal and for various radioactivity in the oceans; \$131,000,000 for Interior Department to study water resources, particularly fish, in the oceans and Great Lakes. Also an open-end authorization for the Navy to build 24 research and survey ships (300-3,000 tons); the new National Science Foundation \$9,950,000 to build similar ships.

POWER PROJECT FISHERIES RESOURCES PROTECTION: S. 2586, a bill to provide for the conservation of anadromous fish spawning areas in the Salmon River, Idaho, was ordered favorably reported by the Senate Committee on Interstate and Foreign Commerce on June 29, 1960. This legislation would prohibit authorization for dams on the Salmon River in Idaho which would exceed in height those dams presently existing on downstream sections of the Snake and Columbia Rivers. Also would prevent licensing of any project by the Federal Power Commission which would tend to have a more restrictive effect on the passage of anadromous fish than similar projects already in existence throughout the Columbia River Basin. Would require the Secretary of the Interior to report to the Congress on any conservation developments including those relating to fish passage around dams that in his opinion would justify amending the provisions of the proposed bill. The bill would open the Salmon River to possible power projects and development.

PUBLIC WORKS APPROPRIATIONS, 1961: Part I--Civil Functions, Department of the Army (Hearings before the subcommittee of the Committee on Appropriations, House of Representatives, 86th Congress, Second Session, to accompany H. R. 12326), February 1960, pp. 1-1431, 1473 pp., printed. Contains, among others, statement of the Director, Bureau of Commercial Fisheries, and the Chief, Branch of Columbia River Fisheries, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service. The appropriation for the Corps of Engineers, Department of the Army, contains funds for the Columbia River Fishery Development Program, and studies to determine the effects of fish and wildlife resources of water-control projects of the Corps of Engineers. The statement of the Director generally points out the importance of the Columbia River fishery development program--a total of 20 hatcheries have been modernized or newly constructed; 400 fish screens have been installed in irrigation diversions, 15 major fishways have been constructed, and stream improvements have made 1,200 miles of stream more accessible to salmon and steelhead. During 1959, some 15 million young salmon and steelhead were produced at program hatcheries. The 1961 budget totals \$1,400,000 for construction and \$1,915,000 for operation and maintenance. The construction budget provides for the following items required to carry forward the program necessary to obtain increased production from areas still accessible

to anadromous fish in order to mitigate fisheries losses resulting from the Federal dam construction program: (1) repairs and additions to several hatcheries; (2) operational studies; (3) screening of diversions; (4) stream improvement; and (5) project appraisal. The printed hearings also contain references to preservation of fish and funds available for that purpose; and fish losses from construction of dams on the Columbia River.

Part I (of two parts)--Civil Functions, Department of the Army (Hearings before the subcommittee of the Committee on Appropriations, United States Senate, 86th Congress, Second Session, on H. R. 12326), February-April 1960, pp. 1-1431, 1473 pp., printed. Contains, among others, statements of the Chief of Division of Resource Management, and Chief of Branch of Columbia River Fisheries, Bureau of Commercial Fisheries, U. S. Department of the Interior. Development of the hydroelectric potential of the Columbia River, as well as flood control and irrigation and navigation needs, has resulted in a program of construction of major dams, which is a civil function of the Corps of Engineers, Department of the Army. These structures have blocked and impeded the access of salmon and steelhead to their spawning areas. Additional dams under construction will further reduce productivity and endanger the commercial and sport fisheries for these species, valued at approximately \$20 million annually. To counteract the expected damage to this resource the Bureau of Commercial Fisheries, in cooperation with the States of Idaho, Oregon, and Washington, prepared a program for the maximum production of salmon and steelhead in streams tributary to the Columbia River. To date this program has included the clearance of obstructions from streams to permit passage of fish, the construction of fishways over waterfalls, the construction and emplacement of screening devices at hydroelectric and irrigation diversions, and the construction of hatcheries and other facilities for the protection and development of salmon and steelhead.

For fiscal year 1961 stream clearing, fishway construction, and screening of water diversions are being continued under the program with special emphasis given to the Willamette System and the area above McNary Dam. The associated activities of project appraisal, operational studies, engineering and inspection, coordination, and general administration will continue. To carry on these activities, the amount of \$1,400,000 is required for fiscal year 1961. This part of the hearings has references to fish and wildlife studies by the U. S. Fish and Wildlife Service; fish facilities; and fish ladders.

Part II (of two parts)--Civil Functions, Department of the Army (Hearings before the subcommittee of the Committee on Appropriations, United States Senate, 86th Congress, Second Session, on H. R. 12326), April-June 1960, pp. 1433-2866, 1475 pp., printed. This year's budget includes for the Columbia River fishery development program, \$1,400,000 for construction and \$1,915,000 for operation and maintenance. This program is designed to counteract damages to fisheries resulting from dam construction and other obstructions in the lower Columbia River. The program has been developed by the Fish and Wildlife Service with funds appropriated to the Corps of Engi-

neers. The Fish and Wildlife Service has coordinated its activities with the fisheries departments of Oregon and Washington. There is an urgent need for an intensified study of the program of fish passage around high dams. This type of study is strongly endorsed by the Columbia Basin Inter-agency Committee. Time is of the essence because normal resource development of our great Pacific Northwest rivers cannot be realized fully until the fish passage problem is solved. The budget also includes an item of \$500,000 for fish and wildlife studies to determine the effects of fish and wildlife resources of water-control projects of the Corps of Engineers. This part of the printed hearings has references to fish and wildlife studies by the U. S. Fish and Wildlife Service; fish facilities; and fish ladders.

H. R. 12326, making appropriations for civil functions administered by the Department of the Interior, the Atomic Energy Commission, the Tennessee Valley Authority and certain study commissions, for the fiscal year ending June 30, 1961; was marked up and ordered favorably reported (S. Rept. 1768) with amendments by the Senate Committee on Appropriations in executive session on June 29, 1960. Includes funds to permit detailed studies by the Fish and Wildlife Service of 191 Corps of Engineers and Bureau of Reclamation projects in the United States, exclusive of the Missouri River Basin. These studies are provided for in the Fish and Wildlife Coordination Act which require that the Fish and Wildlife Service determine the probable effects on fish and wildlife resources of water control projects proposed under the jurisdiction or control of the Federal Government and to insure that fish and wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs. Measures are recommended to protect and, where possible, to develop and improve fish and wildlife.

S. Rept. No. 1768, Public Works Appropriation Bill, 1961 (June 29, 1960, 86th Congress, Second Session, Report of the Committee on Appropriations, to accompany H. R. 12326), 47 pp., printed. In the appropriations for the Civil Functions, Department of the Army, Corps of Engineers, are included: (1) under general investigations for certain river basins and bays \$50,000 for fish and wildlife studies; for Lower Columbia River Fisheries Development \$1,400,000--\$351,000 of which is programmed for Idaho (in view of the importance of Idaho streams to the fishery resources of the Pacific Northwest, the committee desires that these funds be utilized in Idaho, and not diverted to other phases of the program); for the Lower Columbia River fish sanctuary program for operation and maintenance by the U. S. Fish and Wildlife Service is included \$1,915,000.

SCIENCE AND TECHNOLOGY COMMISSION: H. R. 12952 (Brooks of La.), introduced on July 5, 1960, a bill for the investigation of the establishment of a Commission on a Department of Science and Technology; to the Committee on Government Operations.

SHRIMP CONSERVATION WITH CUBA: On June 30, 1960, the House Subcommittee on Fisheries and Wildlife Conservation of the Committee on

Merchant Marine and Fisheries held a hearing on H. R. 9917, a bill giving effect to the convention between the United States and Cuba for the conservation of shrimp, signed at Havana, August 15, 1958. Officials of the Fish and Wildlife Service of the Department of the Interior were heard.

SHRIMP IMPORT DUTIES--LOUISIANA MEMORIAL: A memorial of the Louisiana State Legislature was presented to the House and Senate on June 20. The Memorial urges the President and the Congress of the United States to legislatively institute some type of program to curtail and control the foreign importation of shrimp; referred to the House Committee on Ways and Means, and the Senate Committee on Finance. Copies of the resolution were sent to the President of the United States, members of the Louisiana delegation in the U. S. Congress, and to Presiding Officers of the House of Representatives and the Senate of the Congress of the United States.

STATE DEPARTMENT APPROPRIATIONS: On June 21, 1960, the Subcommittee of the Senate Committee on Appropriations began hearings on H. R. 11666, a bill introduced in the House on April 8, 1960, making appropriations for the Departments of State and Justice, the Judiciary, and related agencies for the fiscal year ending June 30, 1961.

H. R. 11666, was marked up, and ordered favorably reported (S. Rept. 1777), with amendments by the Senate Committee on Appropriations in executive session on June 29, 1960. State Department appropriations provide funds for the international fisheries commissions, to enable the United States to meet its obligations in connection with participation in nine such commissions (including the new Tortugas Shrimp Commission), pursuant to treaties or conventions, and implementing Acts of Congress. This bill passed the House on April 13, 1960.

S. Rept. No. 1777, Departments of State and Justice, the Judiciary, and Related Agencies Appropriation Bill, 1961 (June 29, 1960, Report of the Committee on Appropriations, to accompany H. R. 11666), 17 pp., printed. State Department appropriations include funds for international fisheries commissions. The 1961 budget estimate for this purpose was \$1,925,000, the amount recommended in both Senate and House committees is \$1,875,000--\$150,000 more than for 1960 but \$50,000 less than the budget estimate for 1961. Committee reported the bill to the Senate with various amendments.

The Senate by voice vote on June 30 passed H. R. 11666. All Committee amendments were adopted en bloc. The Senate insisted on its amendments, asked for conference with House, and appointed conferees.

STERN RAMP TRAWLERS: S. J. Res. 216 (Magnuson) introduced in the Senate on June 30, 1960, a joint resolution to authorize the Secretary of Commerce to construct a modern stern ramp trawler to be used for research purposes and authorizing the appropriation of funds. This legislation would provide for the Secretary of Commerce to be authorized to consult with the Secretary of the Navy and Secretary of the Interior to

determine the appropriate size, design, and equipment for a large, modern, stern ramp trawler with scientific facilities suitable for use in general oceanographic studies and as a research vessel to develop basic fisheries sciences and advanced techniques for production, preparation, and preservation of fisheries products from areas distant from ports and subject to severe weather and navigational difficulties. Referred to the Committee on Interstate and Foreign Commerce.

SUPPLEMENTAL APPROPRIATIONS: H. Rept. No. 1223, Supplemental Appropriation Bill, 1961 (June 20, 1960, 86th Congress, Second Session, Report of the Committee on Appropriations, to accompany H. R. 12740), 14 pp., printed. An explanation of the individual items in the bill for various departments and agencies and a detailed tabulation of the budget estimates and recommended appropriations appear in this report. For the Fish and Wildlife Service, the Committee has disallowed the supplemental request for authority to purchase special heavy-duty equipment for 20 passenger motor vehicles. Also disallowed \$4,158,000 requested by the President for a stepped-up Government program for export trade.

H. R. 12740, was reported out on July 1, by the Senate Committee on Appropriations, with amendments (**S. Rept. No. 1832**).

The bill was passed by the Senate on June 30. The Senate insisted upon its amendment, requested a conference with the House, and appointed conferees.

House consideration of the Senate version of H. R. 12740 began July 2. House adopted a resolution (**H. Res. 596**), which in turn would permit the House to consider the Senate amendments to the bill. The House restored to the bill some items which the Senate had deleted. The House also refused to accept the Senate amendments. The Senate insisted on retaining in the final version of the bill certain amendments. If the House would accept those amendments, the Senate in turn would agree to the House position on other amendments. By voice vote, the House agreed to the compromise and sent H. R. 12740 back to the Senate, which acted immediately. The Senate accepted the compromise measure and sent the bill to the White House.

On July 14, 1960, the President signed **H. R. 12740** into public law (**P. L. 86-651**).

TARIFF NEGOTIATIONS: H. Con. Res. 707 (Levering), a concurrent resolution introduced in the House on July 1, 1960, expressing the sense of Congress that the United States should not grant further tariff reductions in the forthcoming tariff negotiations under the provisions of the Trade Agreements Extension Act of 1958, and for other purposes; to the Committee on Ways and Means. Identical to about 37 other concurrent resolutions introduced in both House and Senate since January 25, 1960.

WAGES--MINIMUM HOURLY RATE INCREASE: Minimum Wage Hour Legislation (Hearings before the subcommittee on Labor Standards of the Committee on Education and Labor, House of Representatives, 86th Congress, Second Session, on various bills regarding Minimum Wage Legislation,

May 10, 11, 17, 18, and 19, 1960--Part 3), 1663 pp., printed. Of the 20 million workers not covered by wage-hour law, 61,000 employees that are engaged in fishing or the canning and processing of fish products are specifically exempt, even though they are engaged in commerce, or in the production of goods for commerce. Contains statements of businessmen, representatives of associations, and members of Congress.

H. R. 12677 (Roosevelt), introduced in the House on June 15, 1960, a bill to amend the Fair Labor Standards Act of 1938, as amended, to provide coverage for employees of large enterprises engaged in retail trade or service and of other employers engaged in activities affecting commerce, to increase the minimum wage under the Act to \$1.25 an hour, and for other purposes.

H. Rept. 1933, Fair Labor Standards Amendments of 1960 (June 22, 1960, Report from the Committee on Education and Labor, to accompany H. R. 12677), 63 pp., printed. The committee-reported bill would extend wage-hour coverage under the Fair Labor Standards Act of 1938, as amended, to approximately 3,509,000 additional employees, and increase the prescribed minimum rate per hour for the employees now subject to the act from the present \$1 to \$1.25, based upon a graduated scale over a period of several years. The minimum rate per hour for employees newly brought within coverage of the act would start at \$1 and be gradually increased from year to year also to \$1.25. Among the industries, and the employees therein, which would be affected by the extension of wage-hour coverage and brought under the act are the employees engaged in seafood activities. Under the bill, section 13(a)(5) of the act is amended to exempt any employed in, or necessary to the conduct of, the catching, taking, harvesting, cultivating, or farming of any kind of fish, shellfish, and other stated aquatic forms of life. It is the committee's intent that this additional language also provide an exemption for employees necessary to the conduct of the loading, unloading, or packing of such seafood products for shipment or necessary to the conduct of propagating, processing, marketing, freezing, curing, storing, or distributing the above products or byproducts. The effect therefore, in the committee's view, would be to reaffirm congressional intent in the original seafood exemption including those employees whose services are necessary to the conduct of the stated operations as set forth in the act.

The minimum wage and maximum hour schedules contained in the committee bill both minimize and cushion the alleged impact of applying minimum wage and maximum hours standards to wage earners who would be covered by the Fair Labor Standards Act for the first time under the committee bill. When the bill would first come into effect, the minimum wage would be \$1 an hour and the maximum workweek would be 48 hours; during the second year the minimum wage rate would be \$1.10 an hour, the maximum workweek 46 hours; during the third year the minimum wage rate would be \$1.20 an hour, the maximum workweek 44 hours. The minimum wage rate of \$1.25 an hour would be achieved at the beginning of the fourth year after the effective date of the bill, but the maximum workweek of 42 hours, which would at that time apply to newly covered workers would still be some-

what longer than the maximum workweek of 40 hours applicable to presently-covered workers. The 40-hour maximum workweek would not be achieved for newly-covered workers until the beginning of the fifth year after the effective date of the bill.

The report discusses the purpose, background, areas covered, and problems. Also contains a section-by-section analysis, changes in existing laws, and minority views, as well as additional views by Congressmen Dent and James Roosevelt. Committee reported the bill to the House without amendment.

H. R. 12853 (Kitchin), introduced in the House on June 28, 1960, a bill similar to S. 3758 except that it increases the minimum wage under the act only to \$1.15 an hour instead of \$1.25. The Committee on Rules granted an open rule, with 2 hours debate, waiving points of order, making H. R. 12853 in order as a substitute for H. R. 12677 (Roosevelt).

H. R. 12847 (Kearns), introduced in the House on June 28, 1960, a bill similar to H. R. 12853.

On June 30, by a record voice vote, the House passed H. R. 12677, a bill to amend the Fair Labor Standards Act of 1938, as amended, to provide coverage for employees of interstate retail enterprises and to increase the minimum wage under the act to \$1.15 an hour. By a record vote the House adopted the Kitchin amendment to replace the text of H. R. 12677 with the language of H. R. 12853. Prior to its adoption the Kitchin amendment was amended to exempt certain agricultural commodity processing workers. H. Res. 581, the rule for the consideration of the legislation, had been adopted earlier. The bill as passed by the House would raise the \$1-an-hour-minimum to \$1.15 for the workers now covered by the law effective January 1, 1961. It would also bring another 1.4 million retail workers under the law's protection but their minimum would be \$1 an hour and they would not receive overtime payments. Only employers with five or more retail stores in two or more states would come under the bill. Section 13 of the Fair Labor Standards Act of 1938 is amended so that the exemption for the fishing industry in (a)(5) reads: "any employee employed in or necessary to the conduct of catching, taking, harvesting, cultivating, 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 including employment in or necessary to the conduct of the loading, unloading, or packing of such products for shipment or in propagating, processing (other than canning), marketing, freezing, curing, storing, or distributing the above products or byproducts thereof;" and the exemption for the fish canning industry in (b)(4) reads: "any employee employed in the canning of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any byproduct thereof." But the fish canning exemption is still limited to those employees "employed in the canning of any kind of fish." Present overtime exemption for fish canners and processors is not changed by the bill as passed by the House. The bill is cited as the "Fair Labor Standards Amendments of 1960."

S. 3758 (Morse for Kennedy), introduced in the Senate on June 27, 1960, an original Committee

bill to amend the Fair Labor Standards Act of 1938, as amended, to provide coverage for employees of large enterprises engaged in retail trade or service and of other employers engaged in activities affecting commerce, to increase the minimum wage under the act to \$1.25 an hour, and for other purposes; and placed on the calendar. This bill was reported out by the Senate Committee on Labor and Public Welfare on June 27 (S. Rept. No. 1744). As reported out by the Committee, no change would be made in the year-time overtime exemption now available to fish canners and processors and treats both the canning and processing industry on the same basis.

An amendment covering the fishery exemption was proposed on June 29, in the Senate by Goldwater to S. 3758. The amendment states: On page 21, line 13, strike the period and insert the following: "; or (16) any employee employed in the catching, taking, harvesting, cultivating, 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 including employment in the loading, unloading, or packing of such products for shipment or in propagating, processing (other than canning), marketing, freezing, curing, storing, or distributing the above products or byproducts thereof." This in essence, would broaden the present fishery exemption in the act for fish processors. This amendment was ordered to lie on the table and printed.

S. Rept. 1744, Fair Labor Standards Amendments of 1960 (June 27, 1960, Report from the Committee on Labor and Public Welfare, together with Minority Views, to accompany S. 3758), 96 pp., printed. The bill seeks to increase the minimum wage of those employees presently covered by the act and by extending the benefits of the law to additional workers employed in large retail and service enterprises and other employers engaged in activities affecting commerce. The committee bill makes the following principal changes in the Fair Labor Standards Act of 1938, as amended: (1) Minimum wage for employees now covered by the act is increased by 15 cents an hour during calendar year 1961 and by an additional 5 cents an hour in each of the following 2 years, so as to raise the present minimum wage under the Fair Labor Standards Act from \$1 to \$1.25 an hour over a 3-year period. (2) Coverage is extended to additional groups of employees for whom minimum wages and overtime under the act are set on the following schedule: 1st year after effective date \$1 an hour, no overtime requirement; 2nd year after effective date \$1.05 an hour, overtime after 44 hours a week; 3rd year after effective date \$1.15 an hour, overtime after 42 hours a week; and thereafter \$1.25 an hour with overtime after 40 hours a week. Among others, employees of the seafood processing industry, exempt from the present law, are brought under the minimum wage provisions of the act in accordance with the above schedule, but not under the overtime requirements. This will equalize the treatment of these employees with those engaged in seafood canning who are already covered by the act's minimum wage provisions. The bill does not change the exemption for employees engaged in fishing operations, or in the first processing and canning performed by such fishing employees as an incident to or in conjunc-

tion with their fishing operations. Nor does the bill change the status under the present law of employees who are engaged in the canning of seafood.

The only change the bill makes in these exemptions is with respect to the processing of seafood. Employees engaged in such activities are brought under the minimum wage provisions on the same scale as newly-covered employees in retail and service enterprises. They will continue to be exempt from the overtime requirements.

The change made by the bill will have the effect of placing fish processing and fish canning on the same basis under the act. It is estimated that approximately 32,000 employees will be brought under the minimum wage provisions of the act as a result of the changes made by the bill.

The present exemptions in sections 13(a)(5) and 13(b)(4) have been judicially interpreted to apply to all employees employed in the seafood industry including any employee who participates in activities which are necessary to the conduct of the operations specifically described in the exemptions (*McComb v. Consolidated Fisheries Company*, 174 F. 2d 74, C. A. 3, 1949). These interpretations are consistent with the congressional purpose of treating all employees of one establishment in the same manner under the act and of avoiding segmentation as between different employees of the same employer engaged in the named operations.

For the same reasons, there was included in section 13(a)(5) as amended by the bill an exemption for the "first processing, canning, or packing" of marine products "at sea as an incident to or in conjunction with such fishing operations." The purpose of this additional provision is to make certain that the act will be uniformly applicable to all employees on the fishing vessel including those employees on the vessel who may be engaged in these activities at sea as an incident to the fishing operations conducted by the vessel.

The report also contains 24 pages of "Minority Views," in which members of the committee in the minority group point out their objections to many of the specific amendments contained in the committee bill.

The report also discusses the principal provisions and new coverage; presents a section-by-section analysis, changes in existing law, and relationship to other laws. The bill was reported to the Senate with amendments.

WILDLIFE, FISH, AND GAME CONSERVATION IN MILITARY RESERVATIONS: The Senate on June 23, 1960, passed with amendments H. R. 2565, to promote fish and game conservation and rehabilitation in military reservations. This bill was passed by the House March 21, 1960.



THAWING METHOD BEFORE COOKING EFFECTS FLAVOR OF COOKED FISH

The method used by housewives to thaw frozen cod before cooking has a great deal to do with the flavor-appeal of the cooked product. An experiment conducted by the Home Economics Science Department of the University of Toronto proved that the method of thawing rather than oven temperature affected the palatability of cooked fish.

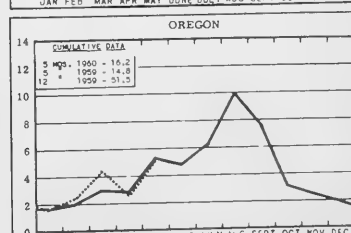
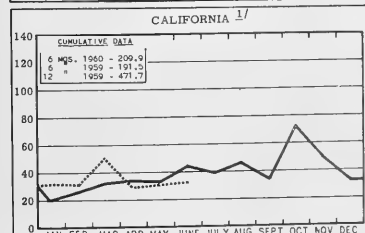
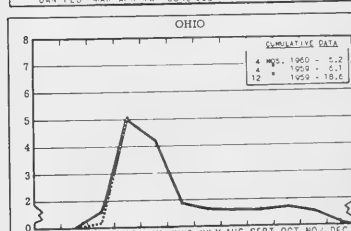
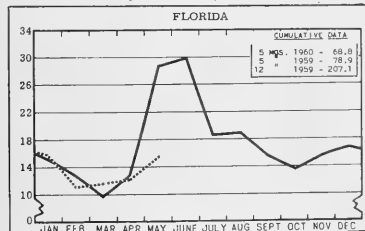
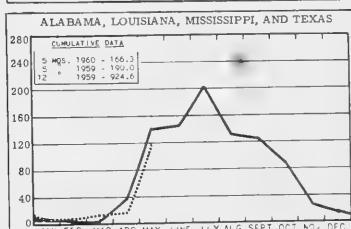
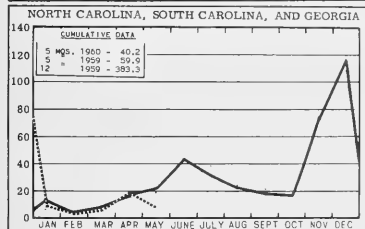
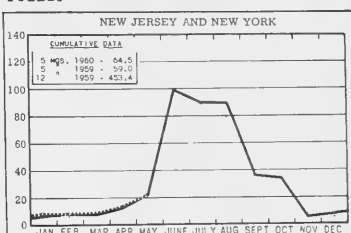
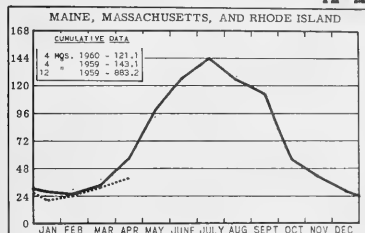
The results of the experiment clearly showed that there was no significant difference in flavor between cod cooked at high or low temperatures for varying lengths of time, but the method of thawing was another matter. A panel of five judges, especially trained in testing cod, expressed a preference for cod which was thawed by submersion in tap water (179 degrees F.) for 50 minutes before cooking over all other methods of defrosting.

Although the experiment was conducted along purely scientific lines, it employed basically the same apparatus found in the modern kitchen. The fish were placed in a freezer prior to the commencement of the experiment, and were cooked in a thermostatically-controlled oven.

FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES

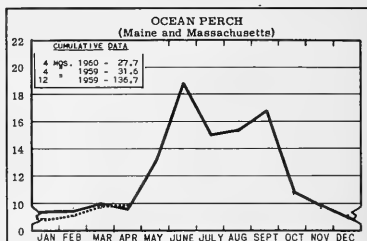
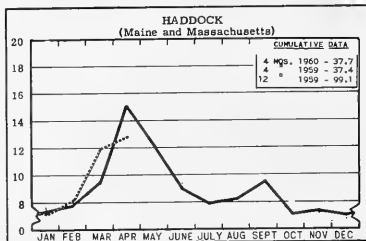
In Millions of Pounds



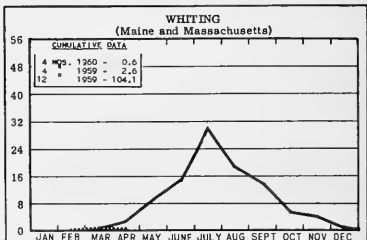
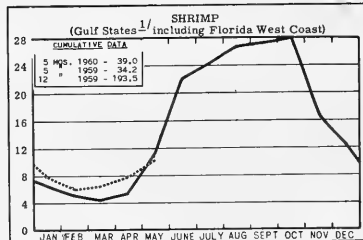
1/ ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

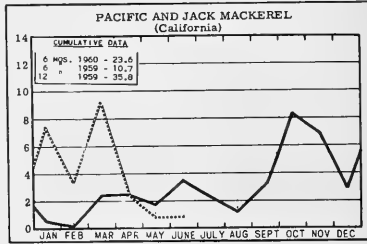
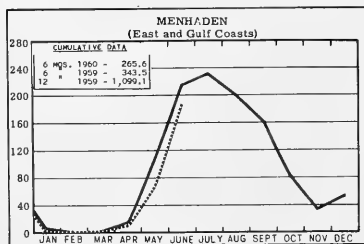


In Millions of Pounds



^{1/2}A. & A.R. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

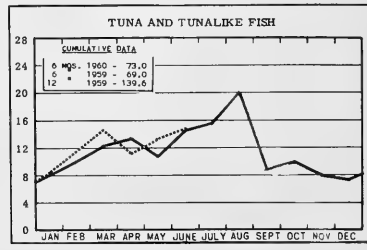
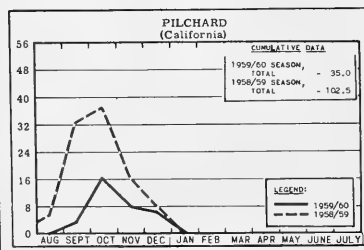
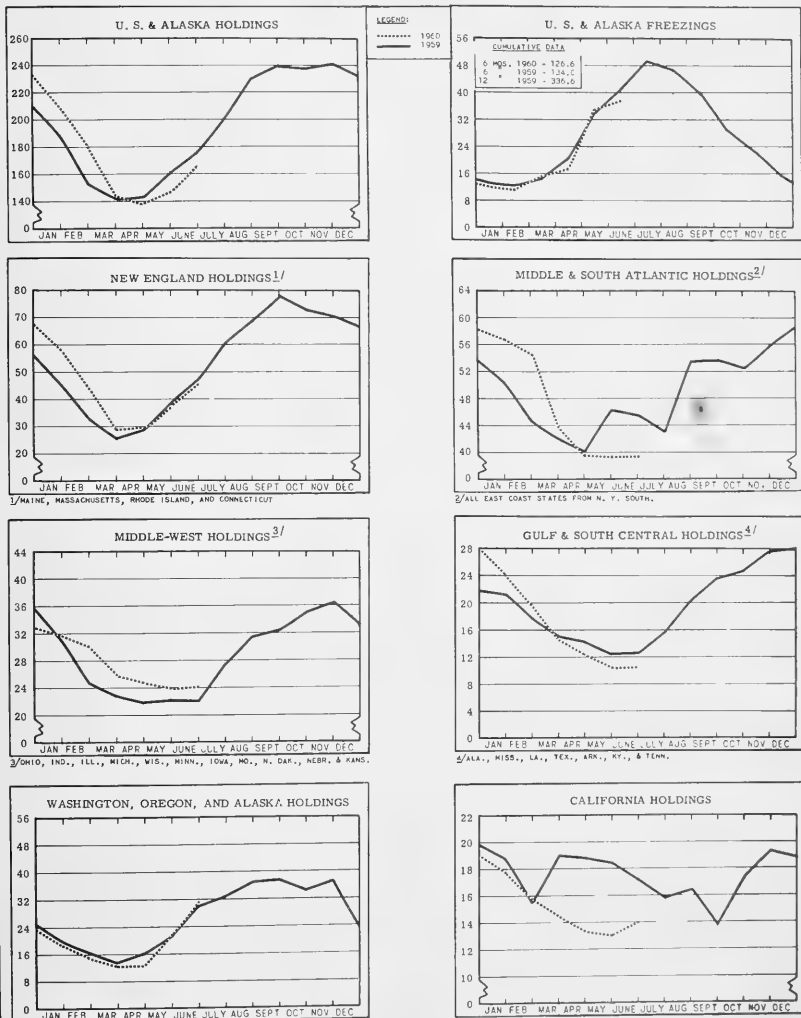


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

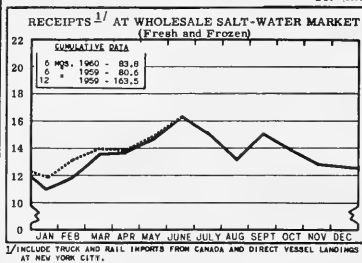
In Millions of Pounds



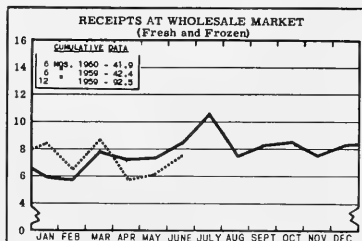
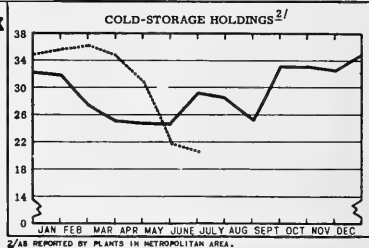
* Excludes salted, cured, and smoked products.

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

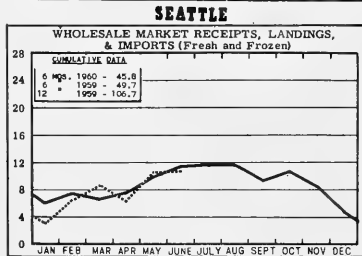
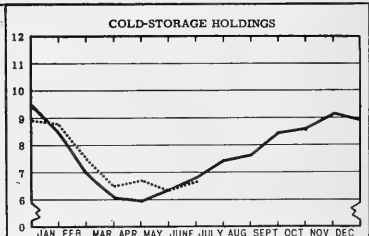
In Millions of Pounds



NEW YORK CITY



CHICAGO



LEGEND:
 1960
 - - - - - 1959
 1958

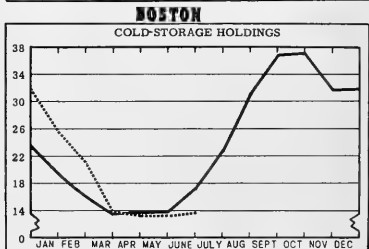


CHART 5 - FISH MEAL and OIL PRODUCTION - U.S. and ALASKA

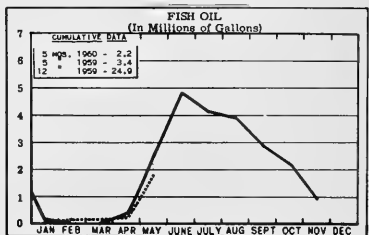
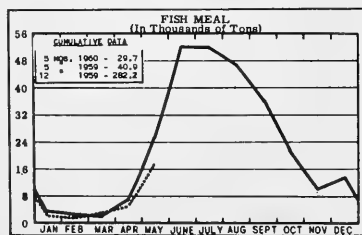
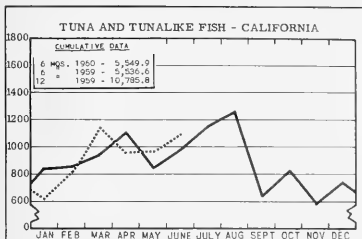
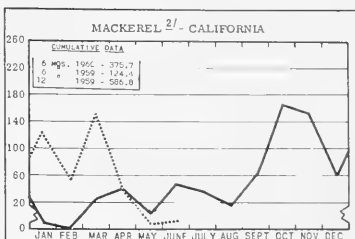


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

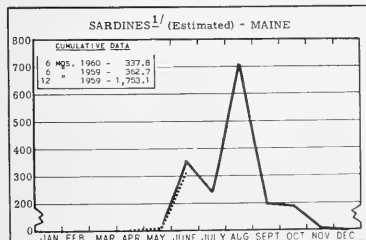
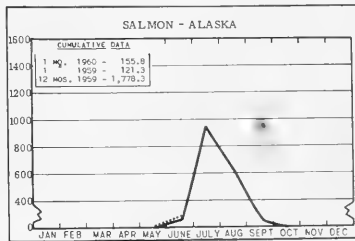
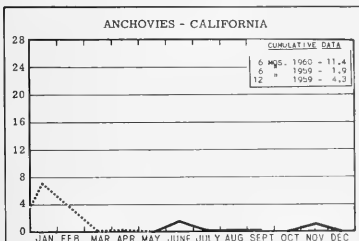
In Thousands of Standard Cases



LEGEND: 1960 (solid line), 1959 (dotted line)

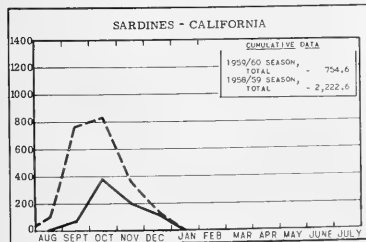


2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



1/ INCLUDING SEA HERRING.

STANDARD CASES			
Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	1/4 drawn	3 1/2 oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	1/2 tuna	6 & 7 oz.
PILCHARDS...	48	1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	1/2-lb.	8 oz.



LEGEND: 1959/60 (solid line), 1958/59 (dashed line)

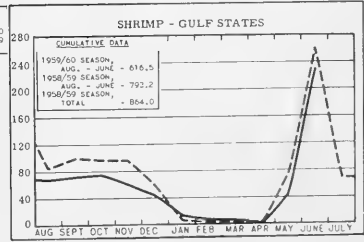
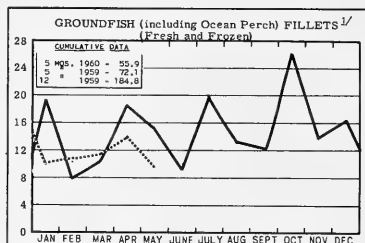
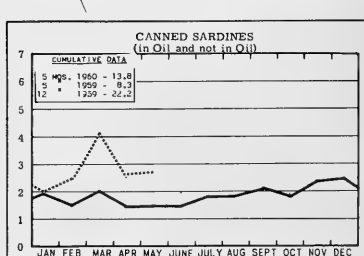
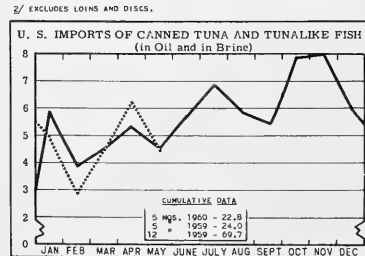
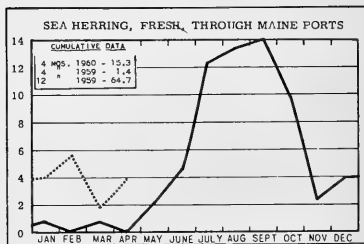
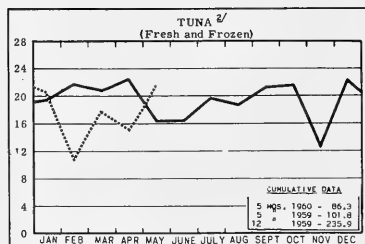
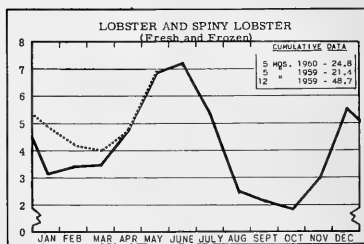
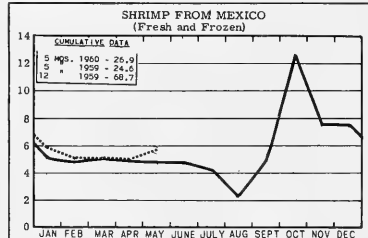
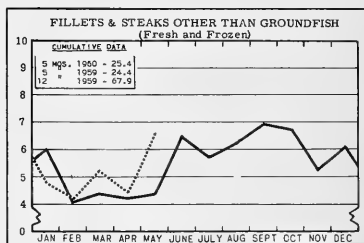


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



^{1/}SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1958.



^{2/} EXCLUDES LOINS AND DISCS.



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.
 SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 WL - WILDLIFE LEAFLETS.
 SSR - FISHERY - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
 SSR - WILDLIFE - SPECIAL SCIENTIFIC REPORTS--WILDLIFE (LIMITED DISTRIBUTION).
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-2240	Fish Meal and Oil, 1959 Annual Summary, 4 pp.
CFS-2286	Fish Meal and Oil, March 1960, 2 pp.
CFS-2290	Frozen Fish Report, April 1960, 8 pp.
CFS-2299	Shrimp Landings, January 1960, 6 pp.
CFS-2301	North Carolina Landings, March 1960, 3 pp.
CFS-2303	South Carolina Landings, March 1960, 2 pp.
CFS-2304	Alabama Landings, January 1960, 2 pp.
CFS-2305	Mississippi Landings, February 1960, 2 pp.
CFS-2306	Fish Sticks and Portions, January-March 1960, 3 pp.
CFS-2308	Texas Landings, March 1960, 3 pp.
CFS-2309	Rhode Island Landings, March 1960, 3 pp.
CFS-2310	California Landings, January 1960, 4 pp.
CFS-2312	Maine Landings, March 1960, 3 pp.
CFS-2314	Oregon Landings, 1959 Annual Summary, 2 pp.
CFS-2316	Alabama Landings, February 1960, 2 pp.
CFS-2317	Imports and Exports of Fishery Products, 1955-1959 Annual Summaries, 10 pp.
CFS-2318	Virginia Landings, April 1960, 3 pp.
CFS-2320	Georgia Landings, April 1960, 2 pp.
CFS-2321	North Carolina Landings, April 1960, 4 pp.
CFS-2322	Alabama Landings, March 1960, 2 pp.
CFS-2323	Fish Meal and Oil, April 1960, 2 pp.
CFS-2324	South Carolina Landings, April 1960, 2 pp.
CFS-2325	Ohio Landings, March 1960, 2 pp.
CFS-2326	New Jersey Landings, March 1960, 3 pp.
CFS-2331	New Jersey Landings, April 1960, 3 pp.

FL-178 (Revised October 1959) - Partial List of Fishing Boat Builders, 6 pp.

FL-478-1 - Canned Fish Consumer Purchases by Family Characteristics (October 1958-September 1959), 62 pp., illus., December 1959. The final report based on a broad marketing research program directed toward improving and expanding the canned tuna, salmon, and sardine markets. It is projected from a nationwide consumer panel of approximately 6,000 families representing 22,000 people. The data represent estimated purchases of canned fish by household consumers only.

The present report summarizes data on household consumer purchases of canned tuna, salmon, and sardines for the 12 months period October 1958-September 1959. It is developed from data appearing in the series of monthly reports entitled "Canned Fish Consumer Purchases". The data are based on reports covering 52 full weeks, whereas monthly data are derived from reports covering 4-week periods.

The purpose of this report is to provide additional information concerning buying practices of households as related to regions, city-size locations, and other socio-economic factors.

FL-481 (Revision of 1-3, April 1941) - Some Desirable Aquatic Plants for Use in Fish Ponds and Aquaria, 1 p., February 1959.

FL-488 - Age Determination of Fishes, by Fred E. Lux, 10 pp., illus.

FL-494 - Fish Mycobacteriosis (Tuberculosis), by Thomas J. Parisot, 3 pp., March 1959.

FL-497 - A "Virus" Disease of Chinook Salmon, by A. J. Ross and R. R. Rucker, 3 pp., March 1960.

WL-414 - Selected List of Fish and Wildlife Materials for Conservation Education, 2 pp., January 1960.

SL-10 - Wholesale Dealers in Fishery Products, Maryland, 1959 (Revised).

SL-101 - Firms Canning Salmon, 1959 (Revised).

SSR-Fish. No. 303 - Physical Oceanographic, Biological, and Chemical Data--South Atlantic Coast of the United States, Gill Cruise 8, by William W. Anderson and Jack W. Gehringer, 231 pp., illus., July 1959.

SSR-Fish. No. 324 - Blood Types in Pacific Salmon, by George J. Ridgeway and George W. Klontz, 12 pp., January 1960.

SSR-Fish. No. 332 - Mycobacterial Infections in Adult Salmon and Steelhead Trout Returning to the Columbia River Basin and Other Areas in 1957, by A. John Ross, Brian J. Earp, and James W. Wood, 36 pp., illus., December 1959.

SSR-Fish. No. 333 - Occurrence and Significance of Trimethylamine Oxide in Marine Animals, by Herman S. Groninger, 24 pp., December 1959. Discusses the finding of trimethylamine oxide in invertebrates as well as mollusca, crustaceans, fish, and other animals. The zooplankton are the first animals in the food chain that contain trimethylamine oxide, a substance which may be synthesized in the cells and may be a product of protein metabolism. Its occurrence in marine animals is interesting because of its indirect effect on the quality of seafood.

SSR-Wildlife No. 48 - Sea Otter Population and Transplant Studies in Alaska, 1959, by Karl W. Kenyon and David L. Spencer, 32 pp., illus., March 1960. Part I of this report presents details of an aerial survey of the western Aleutian area, 1959, and estimates of the sea otter population of Alaska. Part II discusses the sea otter transplant from Amchitka Island to the Pribilofs in 1959. This was the first successful sea otter transplant ever accomplished.

Sep. No. 593 - Proximate Composition of Southern Oysters--Factors Affecting Variability.

Sep. No. 594 - Processing and Quality Studies Held in Refrigerated Sea Water and Ice: Part 4 - Interchange of the Components in the Shrimp-Refrigerated-Sea-Water System.

Sep. No. 595 - Research in Service Laboratories (July 1960): Contains these articles--"Technical Note No. 56 - Chemical Composition and Laboratory Fillet Yield of 13 Species of Middle and South Atlantic Fish," and "Seasonal Variation of Physical Characteristics and Chemical Composition of Fish from Middle Atlantic States."

A Program of Research and Development for the Pacific Coast Tuna Industry, Circular 87, 9 pp., printed. Outlines a program of research and development aid for the Pacific Coast tuna industry. While the legislation authorizing and directing the Bureau to assist the fisheries is broad, the program proposed to aid the tuna fishery stresses those activities that give the most promise of being useful to the industry. The Bureau proposes to assist the tuna fishing industry in three major fields: (1) by helping the domestic fleets find and catch fish more quickly; (2) by helping the fishermen deliver higher quality fish to the canneries and, in turn, help the processors improve their products; and (3) by keeping the domestic industry well informed of activities and developments respecting tuna, both domestic and world-wide, as they may affect production and marketing in the United States, so that the industry can plan its operations intelligently under changing conditions.

Tuna Industry Conference Papers, May 1959, Circular 65, 113 pp., illus., processed, November 1959. Selected papers of the Government-Industry Tuna Conference at Scripps Institution of Oceanography, La Jolla, Calif., May 19-21, 1959. The papers, written by both industry and government specialists in various fishery fields, are grouped by categories. Part 1--The World Tuna Resource and Fishery, includes "The Tuna Resource in Relation to Oceanographic Features," by Vernon E. Brock; "Tuna Fishing Methods and Their Application," by Vernon E. Brock; "World Tuna Production," by Donald R. Johnson; "Status of the Fishery for Tunas of Tropical Waters of the Eastern Pacific," by Milner B. Schaefer; "Status of the Fishery for Tunas of the Temperate Waters of the Eastern Pacific (Abstract)," by Harold B. Clemens; and "Some Observations on Present and Future Japanese Tuna Fisheries," by Wilvan G. Van Campen. Part 2--The Domestic Tuna-Fishing Industry, contains: "Harvesting the Tuna Resource," by Gerald V. Howard; "Handling and Transporting to the Cannery, Part A," by Clarence J. Carlson; "Handling and Transporting to the Cannery, Part B," by Sven Lassen; "Fisheries Loan and Mortgage Programs," by Lester T. Bradbury; and "Publications of the Bureau of Commercial Fisheries of Interest to the Tuna Industry," by Donald R. Johnson. Part 3--Processing and Marketing Tuna, consists of: "Sources of Tuna Consumed in the United States," by Victor J. Samson and Anthony D. Sokolich; "The Processing of Tuna," by Maurice E. Stansby; "Marketing Tuna in the United States," by Donald Y. Aska; "Marketing Tuna in Foreign Countries," by Arthur M. Sandberg; and "Trade Agreements and How They are Made," by Arthur M. Sandberg.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

(Baltimore) Monthly Summary - Fishery Products, January 1960, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 400 E. Lombard St., Baltimore 2, Md.) Receipts at Baltimore by species and by states and provinces for fresh- and salt-water fish and shellfish; total receipts by species and comparisons with previous years; and wholesale prices on the Baltimore market; for the month indicated.

California Fishery Products Monthly Summary, April 1960, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike mackerel and anchovies; pack of canned tuna, mackerel, anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; American Tuna Boat Association auction sales; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, April 1960, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states

and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, April 1960, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; sponge sales; and fishery imports at Port Isabel and Brownsville, Tex., from Mexico; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, May 1960, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for April 1960, 17 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, May 1960, 9 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria, (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

Information and Explanatory Statement for Daily New England Market News Service "Fishery Products Reports" Issued at Boston, 10 pp., June 1960. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Includes a brief description of the fisheries in the various New England ports, and the trading practices. Meanings and definitions of the various abbreviations and terms used in Market News reports are explained.

Honolulu Biological Laboratory--Past (1949-1958)--Present (1959)--Future (1960), by V. E. Brock and J. C. Marr, Fish and Wildlife Circular 83, 65 pp., illus., processed. Honolulu Biological Laboratory, U. S. Bureau of Commercial Fisheries, Honolulu, Hawaii, April 1960. Covers results of research during 1949-1958 on oceanography, fishery resources, bait supplements,

technology, gear development, and biology and behavior of tunas. The 1959 section covers the exploration program; and information on areas of abundance and relation of stocks, efficiency of capture, and bait supplements. The plans for future investigations are discussed briefly. Also includes a bibliography of the Laboratory's publications and translations for 1949-1958.

THE FOLLOWING MARKET NEWS LEAFLET IS AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number Title
MNL-18 - Fisheries of Panama.

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

Annotated Bibliography on Biology of American Menhaden, by John W. Reintjes, James Y. Christmas, Jr., and Richard A. Collins, Fishery Bulletin 170 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 297-322, printed, 25 cents, 1960.

Determining Age of Atlantic Menhaden From Their Scales, by Fred C. June and Charles M. Rothmayr, Fishery Bulletin 171 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 323-342, illus., printed, 20 cents, 1960.

Estimates of Larval Tuna Abundance in the Central Pacific, by Donald W. Strasburg, Fishery Bulletin 167 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 231-255, illus., printed, 25 cents, 1960.

Oceanography of the East Central Equatorial Pacific as Observed During Expedition Eastrropic, by Thomas S. Austin, Fishery Bulletin 168 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 257-282, illus., printed, 35 cents, 1960.

Statistics of the Alaska Herring Fishery, 1878-1956, by Bernard E. Skud, Henry M. Sakuda, and Gerald M. Reid, Statistical Digest No. 48, 24 pp., illus., printed, 25 cents, 1960. Statistics of the herring fishery in Alaska are summarized for the years 1878 to 1956 insofar as detailed data were available. Catches are recorded by statistical areas in Southeastern Alaska, Prince William Sound, and Kodiak and represent a revision of previously-published figures calculated by converting meal production to pounds of fish. Products of the fishery and the statistics of operation are summarized for all Alaska.

Systematics and Biology of the Gizzard Shad (DOROSOMA CEPEDIANUM) and Related Fishes, by Robert Rush Miller, Fishery Bulletin 173 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 371-392, illus., printed, 25 cents, 1960.

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.

ADEN:

A Report on the Fisheries of Aden Colony, The Western Aden Protectorate, and The Eastern Aden Protectorate, 1947-1958, 28 pp., illus., printed, 1s 5d (about 20 U.S.cents). The Fisheries Department, Aden, Aden Protectorate. The first report of the Fisheries Department of Aden, summarizing the fishery activities under a program launched in 1947 to assess the fishery possibilities in not only the Aden Protectorate but the Gulf of Aden area generally. It also includes accounts of activities carried out by the Department since its establishment in 1949 and up to the end of December 1958. Contains, among others, sections on the history of the fisheries, mechanization of the fishing fleet, and the use of improved fishing gear. Also contains information on vitamin A fish oils, nonvitamin A fish oils, the canning of fishery products, a potential offshore rock fishery along the Western Aden Protectorate coast, and colloquial and scientific nomenclature of the more common fishes found in the Gulf of Aden.

ANCHOVIES:

Estudio Biologico Pesquero de la Anchoita (ENGRAULIS ANCHOITA) de Mar del Plata-- Analisis de los caracteres meristicos (Fishery Biological Study of the Anchovy (Engraulis anchoita) de Mar del Plata--Analysis of Their Meristic Characters), by Maria Luisa Fuster de Plaza and Enrique E. Boschi, no. 7, 55 pp., illus., printed in Spanish with English summary. Secretaria de Agricultura y Ganaderia, Departamento de Investigaciones Pesqueras, Buenos Aires, Argentina, 1958.

ANTIBIOTICS:

"The Penetration of Chlorotetracycline into Tissues of Sockeye Salmon on CTC-Dip Treatment and its Destruction on Heating," by Tetuo Tomiyama, Yasuo Yone and Kunio Kobayashi, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 12, 1959, pp. 1012-1018, printed in Japanese with English abstracts. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

"Use of Aureomycin-Ice for the Preservation of Squid," by Kokiichi Oshima, article, Hokusuisi Geppo, vol. 16, 1959, pp. 106-117, printed in Japanese. Hokusuisi Geppo, Hokkaido Fisheries Scientific Institute, Yoichi, Hokkaido, Japan.

ARGENTINA:

Recursos Icticos del Sector Antartico Argentino-- Aspectos Sobre su Aprovechamiento en Georgias del Sur (Fishery Resources of the Argentine Antarctic Region--Aspects of Their Development in South Georgia), by Italo Santiago Car-

rara, 23 pp., illus., processed in Spanish. Universidad Nacional de la Plata, La Plata, Argentina, 1955.

BARENTS SEA:

Results of the Marking of Demersal Fishes of the Barents Sea During the Period 1946-1955, by K.G. Konstantinov, 13 pp., processed. (Translated from Pinro, vol. X, 1957, pp. 78-87). Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, England, 1959.

BIOCHEMISTRY:

"Distribution of a Lipase Enzyme in Lingcod Fillets and the Effect of Low Temperature Storage on its Activity," by J.D. Wood, article, Journal of the Fisheries Research Board of Canada, vol. 16, October 1959, pp. 755-757, printed. Journal of the Fisheries Research Board of Canada, Queen's Printer & Controller of Stationery, Ottawa, Canada.

"Electrophoretic Analysis of Fluids Obtained from Mechanically Disrupted and Frozen Fish Muscle," by Harry L. Seagran, article, Food Research, vol. 24, November-December 1959, pp. 681-687, printed. Food Research, Department of Food Technology, University of California, Davis, Calif.

BIOLOGY:

Fresh-Water Biology, second edition, 1,264 pp., illus., printed. John Wiley & Sons, 440 Fourth Ave., New York 16, N.Y., 1959.

BROOK TROUT:

The Sea-Trou or "Salter" Brook Trout (SALVELLINUS FONTINALIS) Fishery of the Coastal Streams of Cape Cod, Massachusetts, by James W. Mullan, Bulletin No. 17, 25 pp., illus., printed. Massachusetts Division of Fisheries and Game, 73 Tremont St., Boston, Mass., May 1958.

CALIFORNIA:

The Marine Fish Catch of California (For the Years 1957 and 1958), Fish Bulletin No. 108, 74 pp., illus., printed. Department of Fish and Game, Sacramento, Calif., 1960. Tables in this bulletin summarize in various ways the final 1957 and 1958 landings of fish, mollusks, and crustaceans in California by commercial fishing vessels or shipped into California for processing. Statistical data cover annual landings and shipments, 1916-1958; landings and shipments of leading species by pounds and value; licensed commercial fishermen; number of fishing boats by length; origin of shipments, 1957 and 1958; origin of commercial fish landings, 1957 and 1958; monthly landings and shipments, 1957 and 1958--statewide and by areas; value and poundage, annual landings by areas, 1957 and 1958; value of landings by ports and areas, 1957 and 1958; sport catch, 1949-1958; and live-bait catch, 1954-1958. Also contains list of common and scientific names of fish, crustacean, and mollusks.

CANADA:

The Boat Building Industry, 1958, by Dominion Bureau of Statistics, March 1960, 11 pp., illus., printed, 50 Canadian cents. The Queen's Printer and Controller of Stationery, Ottawa, Canada.

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

Canada (Saskatchewan): An Act Respecting Co-Operative Fisheries Limited, Food and Agricultural Legislation, vol. VIII, no. 3, XVIII. 2/59.1, 15 pp., printed, \$1. Food and Agriculture Organization of the United Nations, Rome, Italy, 1959. (For sale by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N.Y.)

Canadian Shellfish for Everyday Meals, Consumer Bulletin No. 6, 16 pp., printed. Queen's Printer, Ottawa, Canada.

Fisheries Statistics of British Columbia, 1959 (preliminary), 14 pp., illus., processed. Canadian Department of Fisheries, Vancouver, Canada, April 1960.

Journal of the Fisheries Research Board of Canada, vol. 16, no. 5, October 1959, 197 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, articles on "Proximate Analysis of Pacific Herring (*Clupea pallasii*) and an Evaluation of Tester's 'Fat Factor'," by J.R. McBride, R.A. MacLeod, and D.R. Ilder; "Homing of Rainbow Trout to Inlet and Outlet Spawning Streams at Loon Lake, British Columbia," by C.C. Lindsey, T.G. Northcote, and G.F. Hartman; "A Concept of Growth in Fishes," by Robert R. Parker and Peter A. Larkin; "The Effect of Sodium Chloride on Proteolysis and on the Fate of Amino Acids Present in the Muscle of Codfish (*Gadus callarias*)," by E. Bilinski and H. Fougere; and "Distribution of a Lipase Enzyme in Lingcod Fillets and the Effect of Low Temperature Storage on its Activity," by J.D. Wood.

Journal of the Fisheries Research Board of Canada, vol. 17, no. 2, March 1960, 167 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others, these articles: "International Passamaquoddy Fisheries Board Fisheries Investigations 1956-59. Introductory Account," by J.L. Hart and D.L. McKernan; "Herring Fishery in Southern New Brunswick," by R.A. McKenzie and S.N. Tibbo; "Predicted Effects of Proposed Tidal Power Structures on Groundfish Catches in Charlotte County, N.B.," by W. R. Martin; "Studies of Haddock in the Passamaquoddy Bay Region," by F.D. McCracken; "Critical Size and Maximum Yield for Chinook Salmon (*Oncorhynchus tshawytscha*)," by Robert R. Parker; "Seasonal Distribution of Some Epipelagic Fishes in the Gulf of Alaska Region," by Ferris Neave and M.G. Hanavan; "The Food of the Redfish *Sebastes marinus* (L.) in the Newfoundland Area," by D.G. Lambert; and "Description of Young Ammocoetes Belonging to Two Species of Lampreys: *Petromyzon marinus* and *Entosphenus lamottenii*," by Vadim D. Vladyskov.

"Passamaquoddy Fisheries Investigations," by S.N. Tibbo and L.R. Day, article, Trade News, vol. 12, no. 8, February 1960, pp. 3-8, illus., processed. Information and Educational Service, Department of Fisheries, Ottawa, Canada. Discusses the economic feasibility of the Passamaquoddy Tidal Power Project. Since 1956,

Canadian and American scientists have been investigating the power potential in the tidal waters of Passamaquoddy Bay, on the U.S.-Canadian border adjacent to New Brunswick's Bay of Fundy. Oceanographic and biological studies were conducted to determine possible effects of the power project on the prosperous herring and groundfish fisheries. Findings showed that the general abundance of herring in the Bay of Fundy and the Gulf of Maine is unlikely to be affected.

Temperatures in Frozen Fish Shipped by Road in Refrigerated Trailers, by C.P. Lentz and E.A. Rooke, 3 pp., illus., printed, limited distribution. (Reprinted from Canadian Food Industries, February 1960.) Canadian Scientific Liaison Office, 1907 K St., N.W., Rm. 403, Washington 6, D.C.

CHILE:

Informaciones Estadísticas Sobre Pesca-Producción Por Especies Comparadas Entre Los Años 1944 a 1951 en Toneladas (Statistical Information on Fisheries--Comparisons of Production by Species Between 1944 and 1951 in Tons), 57 pp., illus., printed in Spanish. Departamento de Fomento de Pesca Y Caza, Valparaíso, Chile, 1953.

COALFISH:

"Behavior of the Young of Coalfish with Respect to a Moving Net Trap (Aquarium Experiments)," by D.V. Radakov and D.S. Nikolaev, article, Zoologicheskii Zhurnal, vol. 38, no. 7, 1959, pp. 1103-1108, printed in Russian with English summary. Akademiia Nauk SSSR, Redaktsiia Zoologicheskogo Zhurnala, Podsovenskii per. d. 21, Moscow B-64, U.S.S.R.

COD:

"Características de Bacalhan com Falta de Sal" (Characteristics of Cod Low in Salt), by J. Freixo, article, Conservas de Peixe, vol. 13, no. 152, November 1958, pp. 18-19, printed in Portuguese. Conservas de Peixe, Regueirao dos Anjos, 68, Lisbon, Portugal.

COMPOSITION:

"Proximate Analysis of Pacific Herring (*Clupea pallasii*) and an Evaluation of Tester's 'Fat Factor,'" by J.R. McBride, R.A. MacLeod, and D.R. Ilder, article, Journal of the Fisheries Research Board of Canada, vol. 16, October 1959, pp. 679-684, printed. Journal of the Fisheries Research Board of Canada, Queen's Printer & Controller of Stationery, Ottawa, Canada.

CRAB MEAT:

"Studies on the 'Browning' of Canned Crab Meat. IV--Soaking of the Raw Material in Water and Heating," by Yoshio Nagasawa, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 12, 1959, pp. 971-975, printed in English. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome Tokyo, Japan.

CRABS:

The Migrations of Adult Female Blue Crabs, CALLINECTES SAPIDUS Rathbun, in Chinco-

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

teague Bay and the Adjacent Waters, by D.G. Cargo, Contribution No. 121, 12 pp., illus., printed. (Reprinted from Sears Foundation: Journal of Marine Research, vol. 16, no. 3, October 15, 1958, pp. 180-191.) Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md.

CROAKERS:

Disappearance of Young Atlantic Croakers from the York River, Virginia, by William H. Massmann and Anthony L. Pacheco, 6 pp., illus., printed. (Reprinted from Transactions American Fisheries Society, vol. 89, no. 2, 1960, pp. 154-159.) Virginia Fisheries Laboratory, Gloucester Point, Va.

DELAWARE RIVER:

Information Bulletin--Delaware River Basin Study, 41 pp., illus., printed. U.S. Army Engineer District, Philadelphia, Pa., 1960. Presents a brief summary of Delaware River Basin water needs and a tentative plan of development. The water control plan is a guide to the development of the basin's water resources so that these water resources will meet the increasing requirements of the continually expanding Delaware basin community. The plan presented is tentatively under consideration and is not necessarily the final plan to be recommended to the Congress on completion of the survey. Benefits of the plan, including increased possibilities for fishing, are discussed briefly.

EAST AFRICA:

East African Fisheries Research Organization Annual Report, 1959, 48 pp., printed. East African Fisheries Research Organization, P.O. Box 343, Jinja, Uganda. Describes scientific work accomplished in the study of Lake Victoria fisheries, experimental fishing, growth of fish under controlled conditions, fish in ponds, identification of tilapia, fish parasites, food of fishes, control of snails, and related subjects. Also includes a bibliography of recent publications on East African fisheries and related subjects, and appendices of research papers on fisheries.

EELS:

"Migration of the European River Eel (*Anguilla anguilla* (L.)) in Atlantic Waters," by V.D. Lebedev, article, Nauchnye Doklady Vyssiei Shkoly: Biologicheskie Nauki, no. 3, 1959, pp. 43-53, printed in Russian. Gosudarstvennoe Izdatel'stvo "Vysshiaia Shkola," Podosenskii per. 20, Moscow B-62, U.S.S.R.

EXPORTS:

United States Exports of Domestic and Foreign Merchandise (Commodity by Country of Destination), Calendar Year 1959, Report No. FT 410, processed, Part I, 172 pp., \$1.25; Part II, 302 pp., \$2. U.S. Department of Commerce, Bureau of the Census, Washington, D.C., March 1960. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) The statistics in Part I cover United States exports of domestic and foreign

merchandise (including fishery products and byproducts) under group 00 through group 5, Part II covers merchandise under groups 6 through 9 (some items of interest to the fishery and allied industries are included). Data are shown by commodity by country of destination.

United States Exports of Domestic and Foreign

Merchandise (Country of Destination by Subgroup), Calendar Year 1959, Report No. FT 420, 83 pp., processed, 50 cents. U.S. Department of Commerce, Bureau of the Census, Washington, D.C., March 1960. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.) The statistics in this report cover United States exports of domestic and foreign merchandise (including fishery products and byproducts) under approximately 100 subgroups by country of destination by subgroup.

FAUNA:

Corixid Insects as Part of the Offshore Fauna of the Sea, by Gordon Gunter and J. Y. Christmas, 2 pp., illus., printed. (Reprinted from Ecology, vol. 40, no. 4, October 1959, pp. 724-725.) Gulf Coast Research Laboratory, Ocean Springs, Miss.

FEDERAL TRADE COMMISSION:

Guides for Advertising Allowances and Other Merchandising Payments and Services: Compliance with Sections 2 (d) and 2 (e) of the Clayton Act, as Amended by the Robinson-Patman Act, 10 pp., printed. Federal Trade Commission, Washington 25, D.C., May 19, 1960. A pamphlet for businessmen on guides for advertising allowances and other merchandising payments and services. This pamphlet can be of value in complying with the laws against giving or receiving improper promotional allowances, including advertising or special services, for promoting products. It will make possible a better understanding of the obligations of sellers and their customers in joint promotional activities. These guides are designed to be both practical and understandable. They contain carefully considered suggestions, or general rules of thumb, which business will find very useful in preventing unintentional violations. They highlight the requirements of law and offer means for complying with it. Also included in the pamphlet is the full text of the Robinson-Patman Act, and what the law covers generally.

FISH MEAL:

"The Carbonate Content of Some Fish and Shellfish Meals," by Claude E. Thurston and Patricia P. MacMaster, article, Journal of the Association of Official Agricultural Chemists, vol. 42, November 1959, pp. 699-702, printed. Association of Official Agricultural Chemists, Box 540, Benjamin Franklin Station, Washington 4, D.C.

"Spontaneous Heating of Fish Meal--II," by C.J. H. Van den Broek, article, Food Manufacture, vol. 34, October 1959, pp. 387-390, printed. Food Manufacture, Leonard Hill, Ltd., Stratford House, 9 Eden St., London NW1, England.

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FISH OIL:

"Preparation of Quaternary Ammonium Salts from Fish Oil and Their Antibiotic Action," by Masamichi Toyomizu, Noriyuki Enomoto, and Yukio Tomiyasu, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 9, 1959, pp. 743-748, printed in Japanese with English abstracts. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

FISH SOLUBLES:

"Condensed Fish Solubles, A Review of Its Preparation and Properties," by Robert A. MacLeod, article, Journal of the Fisheries Research Board of Canada, vol. 16, no. 5, October 1959, pp. 685-694, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Describes the method of preparing condensed solubles by concentrating stickwater after first treating it with acid or enzymes to remove or destroy unwanted proteins. The amino acid and vitamin content of condensed solubles is discussed with particular reference to factors such as freshness of the fish, degree of spoilage of the stickwater, and methods of processing the solubles which cause variations in the levels of these nutrients. The composition of the solubles is also determined by the species of fish used, the age and extent of maturation of the fish, and by the type of material (whether whole fish or scraps) from which it is prepared. The use of condensed fish solubles as a feed supplement is discussed. The need for using solubles of known history both in formulating rations and in nutrition studies is stressed.

FISHERY RESOURCES:

Can We Manage Our Coastal Fishery Resources?, by J. L. McHugh, 6 pp., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 88, 1959, pp. 105-110.) Virginia Fisheries Laboratory, Gloucester, Va. In summary, the author states that "A fresh approach to coastal fisheries problems is needed; one including more biological and educational work and investigation of economic, social, and political factors which are potent influences in the interaction of fisheries resources and man. The conventional approach, by methods designed to foster management for optimum sustained yield for each important species, holds little promise for management of migratory fish in inshore waters of the Atlantic Coast. More consideration should be given to management of the biomass of the entire resource." Some statistics of the Atlantic Coast fisheries are given and promising approaches for bettering management discussed.

FLOUNDERS:

Flounders and Their Cousins Unique Fish, by C. M. Bearden, Education Release 177, 5 pp., illus., printed. (Reprinted from South Carolina Wildlife, 1960.) Bears Bluff Laboratories, Wadmalaw Island, S. C.

FOOD AND AGRICULTURE ORGANIZATION:
Catalogue of FAO Fisheries Publications, October 1959, compiled by Patricia M. Andrews,

FAO/59/10/7400, 17 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Current Bibliography for Aquatic Sciences and Fisheries, vol. 2, no. 10, December 1959, 232 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Indo-Pacific Fisheries Council Proceedings, 8th Session, Colombo, Ceylon, December 6-22, 1958, Section I, 193 pp., printed, US\$1. IPFC Secretariat, FAO Regional Office for Asia and the Far East, Bangkok, Thailand, 1958. (For sale by Publications Section, Food and Agriculture Organization of the United Nations, Rome, Italy). The full proceedings of this meeting consist of three sections of which the first, a report of the proceedings of the 8th Session, is contained in this issue. Section II, the technical papers presented at the meeting by delegations, and Section III, papers read at a symposium on fish behavior, are combined as a separate issue. The present report contains chapters on the Council procedure, resources, technology and economics, publications, technical assistance, recommendations, and a report on the status of the industry. Member governments of the Indo-Pacific Fisheries Council include Australia, Ceylon, France, India, Japan, Korea, Federation of Malaya, Netherlands, Thailand, United Kingdom, the United States, and Vietnam.

Mediterranean Trawling (Fourth Report--Malta, August 1959), by J. Scharfe, GFCM Studies and Reviews No. 10, 23 pp., illus., processed. General Fisheries Council for the Mediterranean Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, March 1960. This report covers a rational study of Mediterranean-type trawls and considerations concerning utilization of engine, variable pitch conopler, and winch. These experiments were mainly devoted to collecting comparative performance data for the conventional Italian-type bottom trawl, the modified sand-eel trawl, and a high opening sprat trawl, the latter two representing northern European designs made of machine-braided nylon webbing, cut to shape. Furthermore, an elliptical-type otter board of Russian design was tested again. Present results indicate that even with bottom fish only the northern European designs, particularly the sand-eel trawl, can compete with the Italian-type trawl under Mediterranean fishing conditions. Recommendations for future trawl studies are included.

Progress Achieved by the Non-Self-Governing Territories in Pursuance of Chapter XI of the Charter--Fisheries in the Non-Self-Governing Territories, United Nations General Assembly, 14th Session, 21 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, June 23, 1959.

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FRESH-WATER FISH:

"Biology of Commercial Fishes in Lakes of Northern Kazakhstan," by V. I. Ereshchenko, article, *Akademiia Nauk Kazakhskoi SSR, Institut Zoolo-gii*, no. 2, 1959, p. 208, printed in Russian. *Akademiia Nauk Kazakhskoi SSR, Institut Zoolo-gii*, Alma-Ata, U. S. S. R.

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"A New Technique for the Measurement of Texture Changes in Fish Muscle, and Its Application in Assessing the Quality of Cold-Stored Material," by R. M. Love, article, *Bulletin de L'Institut International du Froid*, vol. 39, 1959, p. 868, printed. *International Institute of Refrigeration*, 177 Boulevard Maiesherbes, Paris 17, France.

"Preliminary Investigations on the Use of Gunny Sack as a Simple and Economical Means for Storing Quick-Frozen Pomfrets with Special Reference to Protection Against Yellow Discoloration During Storage," *Indian Fisheries Bulletin*, vol. 5, no. 1, January 1958, pp. 19-20, printed in English. *Ministry of Food and Agriculture, Government of India, New Delhi, India.*

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Occurrence of Lignicolous Fungi in Northern Atlantic and Pacific Marine Localities, contribution no. 252, by S. P. Myers and E. S. Reynolds, 10 pp., illus., printed. (Reprinted from *Canadian Journal of Botany*, vol. 38, 1960, pp. 217-226.) *The Marine Laboratory, University of Miami*, No. 1 Rickenbacker Causeway, Miami 49, Fla.

FUR SEALS:

"North Pacific Fur Seal Commission Meets in Moscow," article, *Trade News*, vol. 12, no. 8, February 1960, p. 21, processed. *Information and Educational Service, Department of Fisheries, Ottawa, Canada.*

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"A New Fishing Method for Increasing the Production of Prime Fish in the Coastal Fishery," by G. Predel, article, *Deutsche Fischerei Zeitung*, vol. 5, no. 7, July 1958, p. 200, printed. *Deutsche Fischerei Zeitung, Berlin-Friedrichshagen, Muggelseedamm 310, East Berlin, Germany*

Selectivity of Gill Nets for Lake Whitefish, COREGONUS CLUPEAFORMIS, by A. M. McCombie and F. E. J. Fry, 9 pp., illus., printed. (Reprinted from *Transaction American Fisheries Society*, vol. 89, no. 2, 1960, pp. 176-184.) *Division of Research, Ontario Department of Lands and Forests, Toronto, Ontario, Canada.*

"State of Development and Working Conditions of Floating Trawls," by G. Kajewski, article, *Fischereiforschung*, vol. 1, no. 1, August 1958, p. 1, printed in German. *Fischereiforschung, Institut für Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, E. Germany.*

GENERAL:

Fish Saving (A History of Fish Processing from Ancient to Modern Times), by Charles L. Cut-

ting, 385 pp., illus., printed, 42s. (about US\$5.88). *Leonard Hill Limited, 9 Eden St., N. W. 1, London, England, 1955.* The author of this book, who is trained in the field of fisheries technology, gives a very good account of the "methods evolved by man down through the ages for keeping fish in an edible condition." The contents range from the preservation practices of primitive peoples on through the pre-industrial era, the development of the vast fisheries off Newfoundland, the early history of the fish-canning industry, and on down to the present era. Although the book concentrates on the historical aspects of fish preservation as food, the volume contains many references to the role that salting, drying, and smoking of fishery products played in the development of trade between Europe and the North American colonies. This volume is nontechnical and can be recommended to anyone who wants a background knowledge of a subject for which the material is often scattered and inaccessible. The reference material at the end of each chapter is excellent and besides a general index, is also indexed by species, names, and places.

--H. M. Bearse

GERMANY:

Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung, Neue Folge, Band XV, Heft 4, 1959, 121 pp., illus., printed in German with English summaries. *Berichte der Deutschen Wissenschaftlichen Kommission für Meeresforschung, E. Schweizerbart'sche Verlagsbuchhandlung (Nagel u. Obermiller), Stuttgart W., Germany.* Includes these articles: "Untersuchungen über die Biologie des Wittlings *Merlangius merlangus* (L.) in der Nordsee" (*Biological Research on the Whiting, Merlangius merlangus* (L.), of the North Sea), by Joachim Messtorff; "Untersuchungen über den Anteil Untermassiger Wittlinge in den Fangen der Deutschen Heringsschleppnetzffischerei in der Nordsee" (*Investigations of the Share of Under-sized Haddock in the Catches of the Herring Trawl Fishery of the North Sea*), by Dietrich Sahrhage; and "Die Vertikalverteilung Planktischer Copepoden in der Kieler Bucht" (*Vertical Distribution of Plankton Copepods in the Bay of Kiel*), by Karl Banse.

HALIBUT:

Pacific Halibut Fishery Regulations (Effective March 24, 1960), 12 pp., printed. *International Pacific Halibut Commission Fisheries Hall No. 2, University of Washington, Seattle 5, Wash., March 1960.* These regulations were published in conformity with the Pacific Halibut Fishery Convention between the United States and Canada, signed March 2, 1953. They are based on biological and statistical investigations, designed to show what catch can be taken from the stocks each year. The 1960 regulations are similar to those for 1959, except that fishing grounds in the Cape Scott-Goose Islands region and in the channels of southeastern Alaska which were closed to halibut fishing during the second fishing season in Area 2, Willapa Bay to Cape Spencer in 1959, will be open in 1960.

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HERRING:

The Herring Fishery of the Northwest Atlantic, by Leslie W. Scattergood and S. N. Tibbo, printed, 75 Canadian cents, The Fisheries Research Board of Canada, Ottawa, Canada. (For sale by the Queen's Printer and Controller of Stationery, Ottawa, Canada.) A general account of the history of the Northwest Atlantic herring fishery from aboriginal days to the present. This booklet also describes the catch and its seasonal nature, gear used, utilization of the catch, and the possibility for expansion.

HYDROGRAPHY:

Some Relations Between Air Temperatures and the Surface Water Temperatures of Lakes, by A. M. McCombie, 7 pp., illus., printed. (Reprinted from Limnology and Oceanography, vol. 4, no. 3, July 1959, pp. 252-258.) Ontario Department of Lands and Forests, Division of Research, Maple, Ontario, Canada.

INDIA:

The Development of a Fisheries Extension Service in India, by Charles B. Wade, 41 pp., processed. Government of India, New Delhi, India, January 1959.

Fisheries of Bombay State, 1957, 32 pp., illus., printed. Department of Fisheries, Government of Bombay, Bombay, India.

"Fishing Methods for the Indian Shad Hilsa (Hamilton) in the Indian Region, Part II," by S. Jones, article, Journal of the Bombay Natural History Society, vol. 56, no. 3, December 1959, pp. 423-448, illus., printed, Rs. 15 (about US\$3.15). Bombay Natural History Society 91 Walkeshwar Rd., Bombay 6, India. The methods of fishing for the Indian shad in India, Pakistan, and Burma are described in considerable detail. Some of the nets described are specially designed for landing Hilsa while others are multipurpose nets in which this fish is one of several species caught. In all, about 102 nets are classified, with most of the important ones illustrated. A glossary of local names of fishing gear and tackle with explanations is included.

JAPAN:

Bulletin of the Hokkaido Regional Fisheries Research Laboratory no. 21, February 1960, 61 pp., illus., printed in Japanese with English summaries. Hokkaido Regional Fisheries Research Laboratory, Yoichi, Hokkaido, Japan. Includes, among others, these articles: "Studies on the Sterilization of Fishmeal and the Improvement of its Quality," by H. Oshima, M. Sasajima, and T. Kanzaki; and "Studies on Freezing of 'Surimi' (Fish Paste) and its Application (II): On Freezing of Alaska Pollack 'Surimi' for the Material of Sausage (1)," by K. Nishiya and others.

Bulletin of Tokai Regional Fisheries Research Laboratory, no. 25, August 1959, 79 pp., illus., printed in Japanese with English Summaries. Tokai Regional Fisheries Research Laboratory, Tuskishima, Chuo-ku, Tokyo, Japan. Contains,

among others, these articles: "On Separation of Natural and Fishing Mortality from Total Mortality by Use of an Analogue Computer," by T. Doi; "Vitamin A in Fish Flesh," by S. Hirao, J. Yamada, and R. Kikuchi; and "Vitamin B Contents of Tissues of Red Salmon (Oncorhynchus nerka)," by S. Murayama, M. Yanase, and K. Tabei.

The Tohoku Journal of Agricultural Research, vol. 10, no. 1, March 1959, 156 pp., illus., printed. Tohoku Journal of Agricultural Research, The Faculty of Agriculture, Tohoku University, Sendai, Japan. Includes, among others, the following articles: "The Moisture Distribution in Frozen Meat of Swordfish During Cold Storage," by Y. Tsuchiya and S. Uchimi; and "The Use of Probability Paper for the Graphical Analysis of Percentage Compositions of Chum Salmon with Different Scale Characteristics," by R. Sato.

LAKE TROUT:

Homing Behaviour in Spawning Lake Trout, by N. V. Martin, 4 pp., illus., printed. (Reprinted from The Canadian Fish Culturist, no. 26, March 1960, pp. 3-6.) The Queen's Printer and Controller of Stationery, Ottawa, Canada, 1960.

LAW OF THE SEA CONFERENCE:

2nd United Nations Conference on the Law of the Sea, United Nations, New York, N. Y.

The following processed reports are available from the United Nations, New York, N. Y., distribution limited:

A/CONF. 19/BUR/L. 1., Closing date of the Conference. Note by the Secretariat to the General Committee, 1 p., April 7, 1960

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A/CONF. 19/C. 1/L. 2/Rev. 1/Corr. 1., revised proposal to the Committee of the Whole, Russian only, April 11, 1960.

A/CONF. 19/C. 1/L. 5., Philippines: Amendment to the proposals of the USSR (A/CONF. 19/C.1/L-1), Mexico (A/CONF. 19/C. 1/L. 2), USA (A/CONF. 19/C. 1/L. 3), and Canada (A/CONF. 19/C. 1/L. 4) to the Committee of the Whole, agenda item 9 (II), 2 pp., April 1, 1960.

A/CONF. 19/C. 1/L. 6., Iran, Indonesia, Philippines, Iraq, Saudi Arabia, Jordan, Lebanon, United Arab Republic, Libya, Tunisia, Morocco, Ghana, Guinea, Sudan, Ethiopia, Yemen: proposal to the Committee of the Whole, agenda item 9 (II), 1 p., April 6, 1960.

A/CONF. 19/C. 1/L. 7., Iceland: proposal to the Committee of the Whole, agenda item 9 (II), 2 pp., April 6, 1960.

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A/CONF. 19/C. 1/L. 7/ Rev. 1/Corr. 1., revised proposal to the Committee of the Whole, 1 p., Russian only, April 12, 1960.

A/CONF. 19/C. 1/L. 8., Peru: proposal to the Committee of the Whole, agenda item 9 (II), 2 pp., April 8, 1960.

A/CONF. 19/C. 1/L. 9., Cuba: proposal to the Committee of the Whole, agenda item 9 (II), 2 pp., April 8, 1960.

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A/CONF. 19/L. 4., Report of the Committee of the Whole, 8 pp., including annex, April 14, 1960.

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A/CONF. 19/6/ Add. 1., 2nd UN Conference on the Law of the Sea, Addendum to the Supplement to the Bibliographical Guide to the Law of the Sea (A/CONF. 13/17), 7 pp., text in English, French, and Spanish, March 28, 1960.

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MANAGEMENT AIDS:

Responsibility Accounting Can Pay Dividends, by Martin N. Kellogg, *Management Aids for Small Manufacturers* No. 142, 4 pp., illus., printed. Small Business Administration, Washington 25, D.C., March 1960. Describes the role of responsibility accounting in the management of small manufacturing plants. "Responsibility Accounting" is a relatively new term but it does represent a well-established accounting concept. It increases management vitality in the financial reporting system of a business by providing separate accounting reports of individual executives' operating performances. Thus the executives' responsibility is more clearly established, too. But perhaps the major benefits from a responsibility accounting system are the profit-and-loss thinking and the exercise of initiative that it brings to a management team. This concept, entailing submission of each executive's budget recommendation as well as his regular operating reports, might also be termed "Responsibility Reporting."

MICHIGAN:

Laws Relating to Fishing--1959, 84 pp., printed. Michigan Department of Conservation, Lansing, Mich. Laws pertaining to commercial, inland, and sports fishing in Michigan as well as miscellaneous fishing laws. The section on commercial fishing relates to commercial fishing licenses; special provisions regulating fishing in bays and harbors; fishing regulations for Fort Gratiot Light (Lake Huron), Northport Harbor, and Whaiska Bay; and laws for private fish ponds.

MISCELLANEOUS:

Association of Island Marine Laboratories (Second Meeting, September 17-21, 1958), 28 pp., illus., processed. Bermuda Biological Station, Bermuda, B.W.I.

The First Filling of the Swim Bladder in Salmonoids, by J. S. Tait, 10 pp., illus., printed. (Reprinted from *Canadian Journal of Zoology*, vol. 38, 1960, pp. 179-187.) Laboratory for Experimental Limnology, Department of Zoology, University of Toronto, Toronto, Canada.

A Modified Roller Press for Scale Impressions, by M. H. Baker and H. H. Brohm, 4 pp., illus., printed. (Reprinted from *The Canadian Fish Culturist*, no. 26, March 1960, pp. 31-34.) The Queen's Printer and Controller of Stationery, Ottawa, Canada.

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Marine Mollusca of Point Barrow, Alaska, by Nettie Macginitie, 203 pp., illus., printed. (Reprinted from *Proceedings of the United States National Museum*, vol. 109, no. 3412, 1959, pp. 59-208.) Smithsonian Institution, United States National Museum, Washington, D. C.

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Fisheries--Without River Fisheries--in the Seasons 1955/56 and 1956/57, Report No. 259, 52 pp., illus., processed in Dutch. Landbouw-Economisch Instituut, Conradskade 175, The Hague, Netherlands, May 6, 1958.

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"Rapport om Fiseforsøk Etter al i Herøy-Distriktet, Helgeland, Høsten 1959" (Report on Eel Fishery Research in the Herøy District, Helgeland, Fall 1959), by M. Halas, article, *Fiskets Gang*, vol. 46, no. 14, April 7, 1960, pp. 208-210, printed in Norwegian. Fiskets Gang, Postgiro nr. 691 81, Bergen, Norway.

"Rapport over Fiskeforsøk og Meerkeksperimentet på Makrell, Piggha, og Habrannt i Nordsjøem og Omradene Vest av Hebridene-Shetland med F/S G. O. Sars, 5-26/11-59" (Report on Fishery Research and Tagging Experiments on Mackerel and Sharks in North Sea and West of Hebrides-Shetlands on Cruise of G. O. Sars, November 5-26, 1959), article, *Fiskets Gang*, vol. 46, no. 13, March 31, 1960, pp. 193-195, illus., printed in Norwegian. Fiskets Gang, Postgiro nr. 691 81, Bergen Norway.

"Rapport over Sildeinnsiget 1960" (Report on Herring Outlook for 1960), by Finn Devold, article, *Fiskets Gang*, vol. 46, no. 16, April 21, 1960, pp. 232-236, illus., printed in Norwegian. Fiskets Gang, Postgiro nr. 619 81, Bergen, Norway.

"Smatralernes Lonnsomhet i 1958" (Small Trawler Earnings in 1958), by Arthur Holm, article, *Fiskets Gang*, vol. 46, no. 17, April 28, 1960, pp. 244-250, printed in Norwegian. Fiskets Gang, Postgiro nr. 691 81, Bergen, Norway.

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"The Nutritional Factor," by L. E. Ousterhout, article, *Seafood Merchandising (Annual Review Number)*, vol. 19, November 30, 1959, pp. 13, 52-53, printed. *Seafood Merchandising*, H. L. Peace Publications, 624 Gravier St., New Orleans 9, La.

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Proceedings of the UNESCO Symposium of Physical Oceanography, 1955, Tokyo, 292 pp., illus., printed in English. Japanese Society for the Promotion of Science, Ueno Park, Tokyo, Japan, 1957.

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Commercial Fisheries Catch in Oklahoma, 1957, by Ronald E. Elkin, Jr., Contribution No. 70, 8 pp., illus., printed. (Reprinted from Proceedings of the Oklahoma Academy of Science for 1958, vol. 39, 1959, pp. 183-190.) Oklahoma Fishery Research Laboratory, Department of Wildlife Conservation, Tulsa, Okla. According to the author, "The history of commercial fishing in Oklahoma waters has been one of continuous controversy between sports fishing interests and the commercial fisherman." This paper reports the 1957 commercial fish catch in Oklahoma waters in order to dispel some prevalent misconceptions about the commercial fishing industry, and to provide a sound basis for

a future commercial fishing program. Includes a summary of the commercial fisheries landings in Oklahoma in 1957; commercial landings by months for Grand, Fort Gibson, and Tenkiller Lakes in 1957; and a chart on the monthly aggregate weights of buffalofish, carp, and flat-head catfish from Grand, Fort Gibson, and Tenkiller Lakes in 1957.

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An Abnormal Virginia Oyster with a Bifurcated Muscle, by Gordon Gunter, 2 pp., printed. (Reprinted from Proceedings of the National Shellfisheries Association, vol. 48, 1958, pp. 152-153.) Gulf Coast Research Laboratory, Ocean Springs, Miss.

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cle, *Veterinariia*, vol. 36, no. 6, 1959, p. 63, printed in Russian. Minsel'skogo Khoziaistva SSSR, Orlikov Pereulok d. 1/11, Moscow, USSR.

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"Army & AEC Revive Food Radiation Research by Richard Smith, article, *Food Engineering*, vol. 32, no. 5, May 1960, p. 39, printed. Food Engineering, McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y.

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Selective Predation of Glaucous-Winged Gulls Upon Adult Red Salmon, by Archie S. Mossman, 5 pp., illus., printed. (Reprinted from *Ecology*, vol. 39, no. 3, July 1958, pp. 482-486.) Department of Zoology and Physiology, The University of Wyoming, Laramie, Wyo.

Statistics on Salmon Sport Fishing in the Tidal Waters of British Columbia, 1959, 28 pp., illus.,

processed. Department of Fisheries of Canada, 1110 W. Georgia St., Vancouver 5, B. C., Canada, March 15, 1960. The tidal sport catch of salmon in 1959 declined 3 percent from the 1958 high to a total of 396,375 fish, marking the first time since the publication of sport fish statistics began in 1953 that the total sport catch did not show an increase over the previous year. This was a pink salmon cycle year in the southern part of British Columbia, sport fishermen landing 36,825 pinks, better than a tenfold increase over the 1958 catch. All other species, however, showed a decline from the previous year's catch.

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"Chemical Studies on the Volatile Constituents of Seaweed. XIV--On the Volatile Constituents of *Laminaria* sp. (2)," by Teruhisa Katayama, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 24, no. 11, 1959, pp. 925-932, printed in English. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

"Seaweeds Associated with Kelp Beds Along Southern California and Northwestern Mexico," by E. Yale Dawson, Michael Neushul, and Robert D. Wildman, article, *Pacific Naturalist*, vol. 1, no. 14, March 11, 1960, 79 pp., illus., printed. Beaudette Foundation for Biological Research, Box 482, R. F. D. 1, Solvang, Calif.

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of Japanese extraction. The commercial shrimp are fished at moderate depths, ranging from 15 to 70 fathoms. There are two methods of trawling used in the shrimp fishery--otter trawling and beam trawling. However, on the majority of shrimp boats, operated on a one-man basis, the more easily handled beam trawl is preferred by the fishermen.

Cystine and Total Sulfhydryl Content of Unspoiled and Spoiled Shrimp, by Caroline H. Kurtzman, Donald G. Snyder, and Hugo W. Nilson, 8 pp., printed. (Reprinted from *Food Research*, vol. 25, no. 2, 1960, pp. 237-244.) Bureau of Commercial Fisheries, Fisheries Technological Laboratory, College Park, Md.

Shrimp (Report on Investigation No. 332-38, Under Section 332 of the Tariff Act of 1930, Pursuant to a Resolution of the Committee on Ways and Means of the United States House of Representatives, Adopted February 9, 1960), 117 pp., processed. U. S. Tariff Commission, 8th and E. St., N.W., Washington 25, D. C., May 1960. Describes the domestic shrimp fishery and the processing of shrimp in the United States; discusses domestic production, exports, imports, and consumption of raw shrimp and shrimp products; and gives data on prices and cold-storage holdings.

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FIVE-FOOT SARDINE SANDWICH AT NATIONAL BOY SCOUT JAMBOREE

A gigantic Maine sardine sandwich designed to provide a meal for 77 persons was a highlight of the National Boy Scout Jamboree, Colorado Springs, Colo. The colorful seafood spectacular was concocted by Troop 72 of the Maine Pine Tree Council as its project in the week-long Skill-O-Rama which is a feature of the 60,000-boy encampment.

Troops from all sections of the country vie for honors as they perform feats of science, art, cookery, and other activities.

The sandwich was assembled as a three-decker with a five-foot loaf of bread made by a Portland, Maine, baking firm and shipped by air to the site. The filling consisted of mustard butter on the bread, chopped lettuce, sliced green peppers, sliced tomatoes and raw onions, and whole sardines. It was originated by the Maine Sardine Council's home economist.

The sandwich was quickly eaten by 75 scouts and visiting onlookers.

Editorial Assistant--Ruth V. Keefe

Illustrator--Gustaf T. Sundstrom

Compositors--Jean Zalevsky, Alma Greene, and Vera Eggleston

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P. 28-(lower left)--Basil L. Smith System, Phila., Pa.; p. 28-(lower right)--F. A. Bailey; p. 80--Bailey, Virginia Fisheries Laboratory.





NATIONAL FISH 'n SEAFOOD PARADE--OCTOBER 17-23, 1960

The Fishing Industry and the U. S. Bureau of Commercial Fisheries are working together to encourage the greater use of fish and shellfish products during the "Fish 'n Seafood Parade"--October 17-23, 1960. This is the Fishing Industry's sixth annual all-out promotion channeled over radio, television, newspapers, and magazines. All types of fresh, frozen, canned, smoked, precooked, and cured fishery products and fish dinners are being advertised. Many retail stores and restaurants are making a concerted effort to display and stock the many varieties of fishery products available.

Preparations for the Seafood Parade began gathering momentum in June 1960 when the Fish 'n Seafood Parade National Committee made a broadside mailing of 4,500 brochures to chain stores, distributors, and other segments of the industry. Also, the Committee unveiled an in-store advertising kit in color based on an 8-foot mobile, the top section of which has been redesigned especially for this year's Parade. Included are diecut paper posters duplicating elements in the mobile as well as a decorative set of cutouts designed for use on store windows, display cases, and similar locations.

U. S. Bureau of Commercial Fisheries field men are helping to obtain newspaper, radio, and television publicity, and are cooperating in many other ways. A special marketing bulletin has been distributed to food editors and home economists. Fact sheets with recipes have been released to restaurants, institutions, and schools. Also Bureau field men and home economists are available for radio and television appearances.

Here is an opportunity for every segment of the fishing and allied industries to unite in one big appeal to the consumer. Children are back in school; vacations are over; fishery products are more plentiful than at any other time of the year; and prices are at attractive levels.

Timmy Tar says:

"Get ready to haul in the catch, mate!"



OCTOBER 17-23 is
**Fish 'n Seafood
Parade**

NATIONAL COMMITTEE, FISH 'n SEAFOOD PARADE

1014 20th STREET, N.W., WASHINGTON 6, D.C.

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ROBERT H GIBBS JR

COMMERCIAL FISHERIES REVIEW



Vol. 22, No. 9

SEPTEMBER 1960

FISH and WILDLIFE SERVICE
United States Department of the Interior
Washington, D.C.



COMMERCIAL FISHERIES REVIEW



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

Joseph Pileggi, Editor
H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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5/31/63

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QUALITY IS BECOMING BYWORD OF FISHING INDUSTRY

"Enforcement of high quality standards is becoming the byword of the fishing industry," Assistant Secretary of the Interior Ross Leffler told the wives of fishery executives on May 3, 1960, at the fifteenth annual convention of the National Fisheries Institute, Miami Beach.

He explained that quality standards are now in effect for fish sticks, raw breaded shrimp, haddock and cod fillets, halibut steaks, and that standards are now being developed for 11 additional fish and shellfish products.

"What does this mean?" he asked. "It means that the homemaker will be protected when she plunks down her money for fish--that she can be assured of a high-quality product for her table."

In answering "How good is fish as a food and why," he reminded his audience that fish and shellfish are not only excellent sources of high-grade animal protein, minerals, and vitamins, but these products are generally easily digested and most are low in calories. All these qualities make these products ideal for serving children and old people, and for including in reducing and other special diets.

Leffler also reminded his audience of the announcement made in October 1959 of the important "nutritional breakthrough" in which it was demonstrated conclusively that oils found in fish and shellfish were cholesterol depressants. Cholesterol, of course, is the number one suspect in heart disease and hardening of the arteries. The depressant action of fish and shellfish oils is significantly greater than it is for the fatty acids from corn oil and other fats.

"Further research must be carried on," he explained. "But if such research is completed successfully, it may be possible to produce and market a fish-oil fatty acid for use as a means of adjusting cholesterol levels in the blood with a minimum of caloric intake."



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LOBSTER EXPLORATIONS ON CONTINENTAL SHELF AND SLOPE OFF NORTHEAST COAST OF THE UNITED STATES

By Ernest D. McRae, Jr.*

SUMMARY

Commercial quantities of American lobsters (*Homarus americanus*) were found in deep water as a result of explorations conducted by the U. S. Bureau of Commercial Fisheries on the continental shelf and slope off the northeastern portion of the United States in depths of 50 to 600 fathoms. Two areas were defined by the Bureau's exploratory research vessel Delaware in which sufficient numbers of lobsters were taken to indicate the feasibility of commercial-scale exploitation. Standard commercial trawling gear was used at all of the 211 stations covered in the investigation.

BACKGROUND

Experimental trawling on the continental shelf and along portions of the continental slope of the northeastern coast of the United States by government vessels dates back to the early 1800's. Records of lobsters taken from depths and regions other than those fished by commercial lobstermen are found among the data of these early explorations. In addition, information from the research of the Woods Hole Oceanographic Institution has contributed substantially to the store of knowledge available concerning those waters and the lobster resource (Schroeder 1955 and 1959).

Taking of deep-water lobsters incidental to groundfish trawling became increasingly commonplace, and, by 1947, approximately 85,000 pounds of lobsters were taken by trawlers in offshore waters between Barnegat Lightship and Winter Quarter Lightship alone (June and Reintjes 1957). Since 1947, a small Atlantic Coast fishery, specifically for deep-water lobsters, has slowly developed. Small and medium trawlers have utilized the lobster resource largely as an interim fishery in the summer months. Fishing efforts have been limited, for the most part, to depths of 65 to 70 fathoms in areas south of Cape Cod and in the vicinity of Hudson Canyon.

Late in 1954, a program of deep-water exploratory trawling along the edge of the continental shelf off the North and Middle Atlantic States was planned by the U. S. Bureau of Commercial Fisheries. Purpose of the exploratory program was to determine the extent of potential trawling grounds in depths exceeding those normally fished by commercial trawlers. The studies were originated as part of the Bureau's continuing effort to explore and develop the latent potentialities of offshore marine fishery resources and to encourage their utilization by the commercial fishing industry. Work was initiated on the program early in 1955 with the first cruise of the year of the Bureau's exploratory research vessel Delaware (Delaware Cruise No. 1-55, January 5-13, 1955). During this and the three cruises following, areas lying along the eastern and southern edges of Georges Bank were investigated (fig. 1). Included in the data resulting from the four cruises were indications of a potential commercial lobster resource in the deep waters explored.

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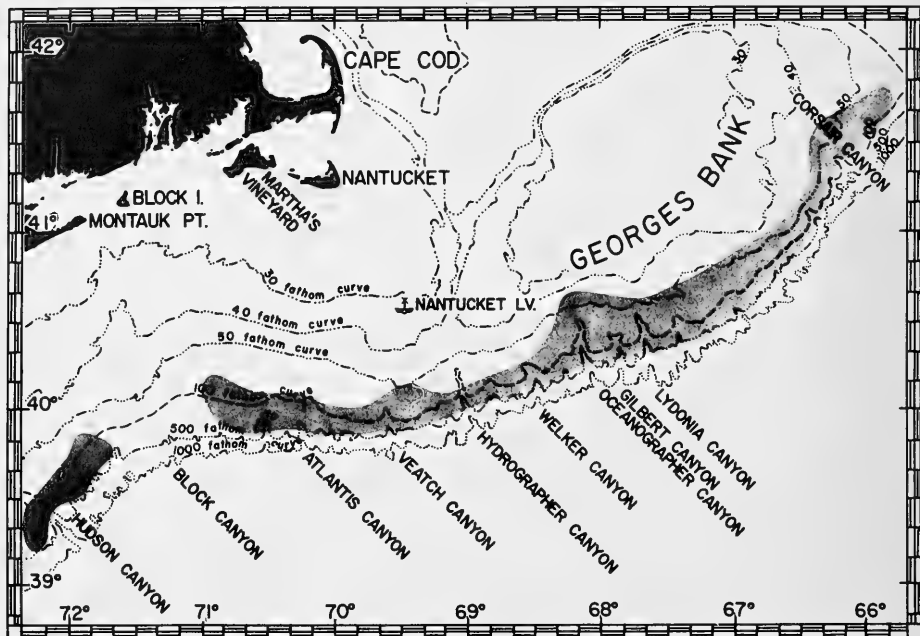


Fig. 1 - Region covered by deep-water exploratory operations of the exploratory research vessel *Delaware*, 1955-56.

OPERATIONAL PROGRAM

The favorable results of the 1955 cruises indicated that, with further exploration and with the development of modern methods of keeping lobsters alive and of shipboard vacuum-packing and freezing of lobster tails, the existing small fishery for deep-water lobsters could be expanded to the point where it would become a larger specialized segment of the domestic fishing industry. The Bureau, therefore, planned a follow-up program to investigate more thoroughly the deep-water lobster resource. Included in the program were exploratory, technological, biological, and marketing studies. Four lobster cruises were scheduled for the *Delaware* for 1956. These were designed to: (1) complement the lobster data obtained during the preceding explorations by providing more detailed coverage of the areas where the best lobster catches had been made; (2) supplement previous explorations by extending the investigation farther south; (3) tag lobsters to determine, if possible, the relationship of the deep-water population to other lobster populations; and (4) investigate methods of handling and preserving lobsters and lobster meat aboard ship and ashore.

By October 1956, with the completion of the last scheduled lobster cruise for that year, the accomplishments of the over-all program included the following: (1) the lobster population along some 300 miles of the continental slope had been sampled and two areas showing definite promise of potential commercial concentrations of lobsters had been found; (2) a total of 2,406 live lobsters in good condition and suitable for tagging had been tagged in cooperation with the Marine Fisheries Department of the Commonwealth of Massachusetts and released in the area of capture, and a few tagged lobsters had been retaken; (3) an additional 526 lobsters, chiefly females with eggs, had been kept alive in tanks of circulating sea-water

and turned over to the marine fisheries departments of the states of Massachusetts and Rhode Island for tagging and release in selected inshore areas; and (4) studies of techniques for handling fresh, frozen, and, cooked lobster meat aboard ship and inshore installations had been made, and freezer-storage and taste-panel tests for the evaluation of the palatability of lobster meat after extended storage had been conducted by the Bureau's technological laboratories (Peters and Slavin, 1956, 1958; Pottinger 1950; Slavin and Peters 1956, 1958). In addition, tests to determine consumer acceptance of the meat of lobsters from deep water were completed in some of the New England area's leading restaurants and dining rooms.

EXPLORATORY VESSEL, GEAR, AND EQUIPMENT

The M/V Delaware is a conventional side-rigged North Atlantic otter trawler of steel construction with modifications for research work (fig. 2). The vessel's over-all length is 147.5 feet, its beam is 25 feet, its draft 14 feet 8 inches, and its displacement weight 518 tons. It has a cruising range of 8,000 nautical miles. There are accommodations available for 23 men, although the normal complement during exploratory fishing consists of 13 officers and crew members plus from 1 to 3 specialists.



Fig. 2 - M/V Delaware, exploratory research vessel of the Bureau's Exploratory Fishing and Gear Research Base, Gloucester, Mass.

Standard No. 41 nets (Knake 1956, 1958) were used during the lobster operations with bracket-hung trawl doors measuring 4 feet 6 inches by 10 feet 6 inches. Extra shoes were added, increasing the weight of each door to 1,440 pounds, to enable them to tend bottom more effectively during deep-water drags. Both round and trawl-plane floats of cast aluminum alloy were used on the headrope; and, during all but 25 of the 211 drags, 45 feet of 16- to 18-inch rollers were rigged on the footrope.

In exploratory fishing, more gear damage is normally expected than in regular commercial fishing owing to general unfamiliarity with bottom topography and the location of snags and obstructions in the areas fished during exploratory operations. Gear damage during the present lobster explorations, however, was light and no greater than would be expected from a comparable amount of commercial fishing on known grounds. No damage was incurred during 189 of the 211 drags, 23 of which were made with chain gear rather than roller gear. Roller gear was used routinely during the explorations because, although chain gear may possibly fish more effectively than roller gear for some fish and shellfish, there is a greater possibility of damaging or losing the chain-rigged net.

EXPLORATORY COVERAGE

The 1955 explorations were conducted in an area along the outer edge of Georges Bank, between 41° 45' N. lat., 65° 53' W. long., and 39° 55' N. lat., 69° 53' W. long. The 1956 explorations supplemented those of 1955 in areas requiring more complete coverage, expanded the explorations in the vicinity of Veatch and Lydonia Canyons, and extended the range of the explorations westward as far as 72° 17' W. long. (at 39° 14' N. lat.). The areas are shown in figure 1.

Trawling in 1955 was conducted in depths ranging from 50 to 420 fathoms and in 1956 from 62 to 600 fathoms, with the majority of the drags in depths ranging from 100 to 300 fathoms. The combined areas trawled during the investigation aggregated approximately 350 miles long and from 5 to 15 miles wide on the edge of the continental shelf and slope between Northeast Peak on Georges Bank and the southern side of Hudson Canyon. Coverage, except in an area approximately 15 to 20 miles long near Block Canyon, was reasonably complete (fig. 1).¹

¹ In December 1958, five drags were made to spot check the areas from which the best catches of lobsters had been taken during the 1956 explorations. One of these drags was made west of Lydonia Canyon, and the other four were made near Veatch Canyon. Catches resulting were similar to those made earlier in the same areas.

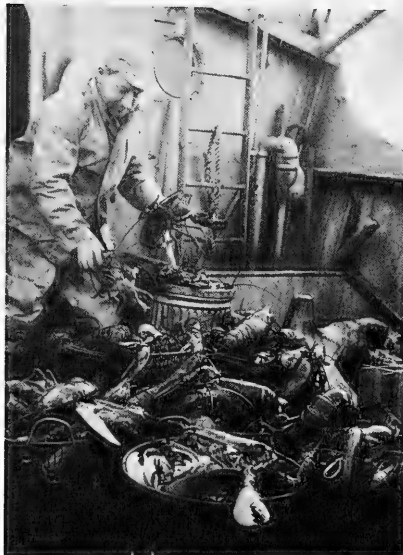


Fig. 3 - Deep-water lobster catch taken during lobster explorations and typical of catches made in productive areas.

FISHING RESULTS

Best fishing during the 1955-56 explorations was experienced in two areas on the southern edge of Georges Bank: The area between Veatch and Hydrographer Canyons; and an area lying immediately east of Lydonia Canyon (fig. 1).

The first of these areas, between Veatch and Hydrographer Canyons, covers a linear distance of approximately 15 miles between $69^{\circ}12'$ W. long., and $69^{\circ}32'$ W. long. Fishing rates are shown in figure 4. Best fishing was found between 150 and 250 fathoms. The best single drag in this area resulted in 860 pounds of lobsters (215 individuals) in 100 minutes of fishing time.

The second area, lying immediately east of Lydonia Canyon, extends for a distance of approximately 53 miles between $66^{\circ}30'$ W. long., and $67^{\circ}40'$ W. long. Fishing rates in this, the largest and most productive ground fished, are depicted in figure 5. Although several good catches were obtained in both deeper and shallower waters adjacent to the area of greatest production, best fishing was again found between 150 and 250 fathoms. The best drag in this area resulted in an estimated 1,240 pounds of lobsters (177 individuals) in 95 minutes fishing time.

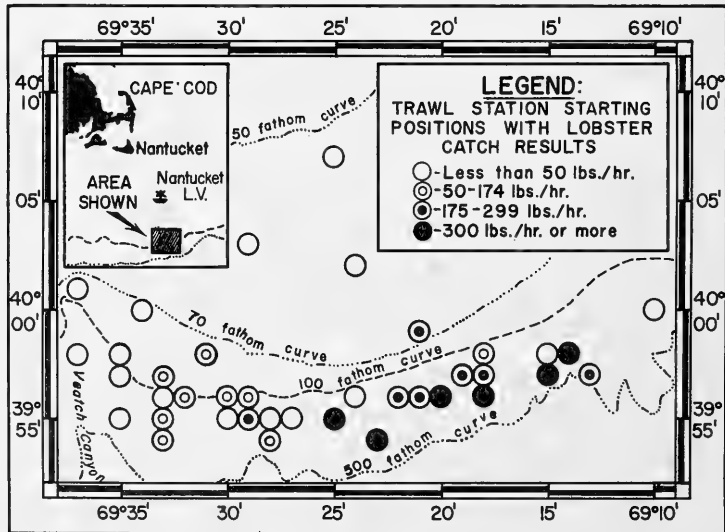


Fig. 4 - Results of exploratory trawling in the area between Veatch and Hydrographer Canyons—one of the most productive areas fished.

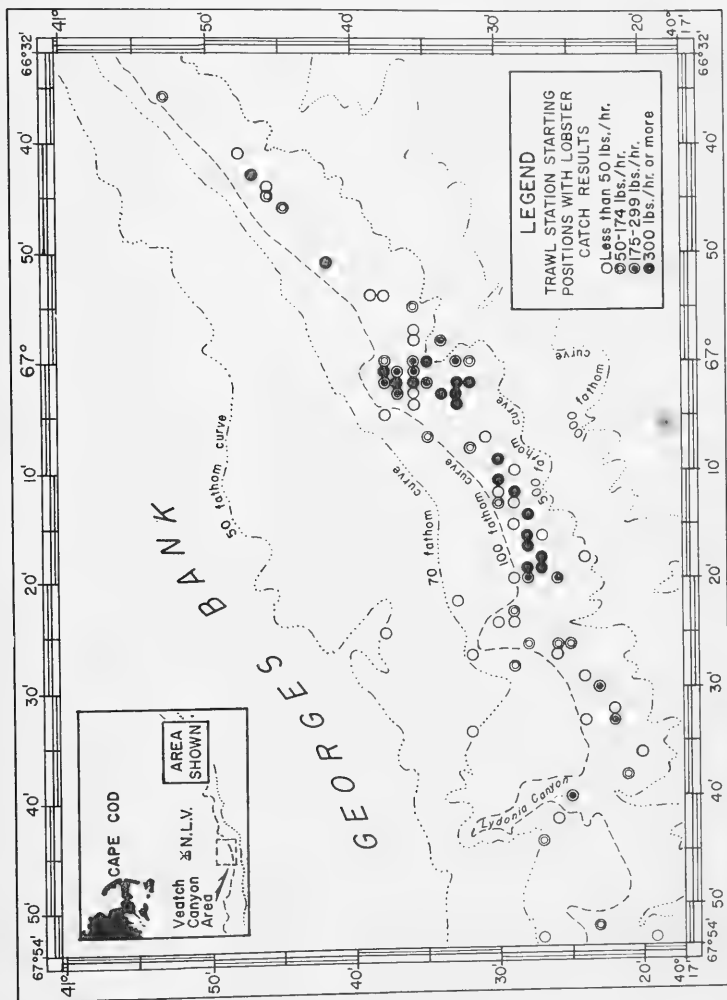


Fig. 5 - Results of exploratory trawling in the area lying east of Lydonia Canyon, the best lobster-producing area found in the 1955-56 explorations.

Throughout the 1955-56 explorations, the 150- to 250-fathom depths were the most productive (fig. 6). In most cases, catch rates decreased on either side of those depths.

NATURE OF DEEP-WATER POPULATION

Detailed population studies are not within the scope of exploratory fishing, but a few observations on the population are vital to an understanding of the commercial resource and its potential value to the industry. For that reason, they are presented here.

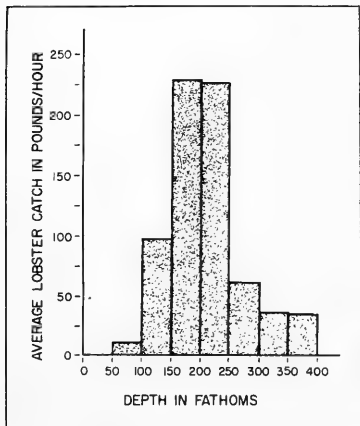


Fig. 6 - Relation between the lobster catch and depths fished. Based on results of 200 drags. Depth indicated was recorded at start of drag. Within-drag variations in depth are not indicated.

A total of 5,445 lobsters was counted in the 1955-56 lobster explorations. The largest lobster caught weighed 27 pounds. A random sample of 381 "2-clawed lobsters" caught on Delaware Cruise 16 was brought ashore for accurate weighing. Of this number, 111 were males and 270 were females. Of the females, 71 were egg-bearing. The mean weights (to the nearest one-eighth ounce) were: Males, 5 pounds 7 ounces; non egg-bearing females 5 pounds $1\frac{1}{2}$ ounces; and egg-bearing females 6 pounds $1\frac{3}{8}$ ounces. These weights are not to be interpreted as being representative of the average population of deep-water lobsters, but rather as representative of the average weight of lobsters available to 16- to 18-inch roller gear used generally throughout the Delaware investi-



Fig. 7 - One of 2,406 deep-water lobsters tagged and released in the area of capture in cooperation with the Marine Fisheries Department of the Commonwealth of Massachusetts.

Some conjecture has arisen that offshore lobsters may be a different species from the inshore lobsters. This, as yet, has not been demonstrated. The number of returns from the tagged deep-water lobsters has been limited, and no positive conclusions can be drawn. In general, the results indicate only that the tagged lobsters tend to remain near areas where they were originally caught, tagged and released.

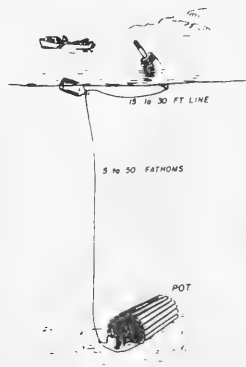
The deep-water population is probably unique in one way; it may possibly be one of the few natural American lobster populations that has not been subjected to heavy modification by man.

APPENDIX

A detailed fishing log, showing geographic position, depth, date, catch, and related data for each drag is available as an appendix to the reprint of this article. Write for Separate No. 598, which includes "Table 1--Fishing Log--Lobster Drags made off the Northeast Coast of the United States, M/V Delaware, 1955-56."

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A SMALL-BOAT TUNA LONG-LINE FISHERY

By Peter C. Wilson*

SUMMARY

Small fishing vessels from Gloucester, Mass., have successfully fished subsurface bluefin tuna (*Thunnus thynnus*) on Stellwagen Bank in Massachusetts Bay using long-line gear especially adapted to inshore operations for large tuna. During the short season between mid-August and late October, boats 35 to 40 feet in length have made catches of approximately 60,000 pounds per vessel.

BACKGROUND

Seasonal bluefin tuna stocks in waters off the New England coast have for some time appeared to be substantial. However, to date, this resource has been exploited only to a limited degree.

OFFSHORE TUNA: Studies made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware over the last five years indicate the feasibility of the development of a long-line fishery in oceanic areas off New England at certain seasons, and a recent attempt by the Gloucester medium trawler *Golden Eagle*, using Bureau gear^{1/} and assisted by technical personnel, met with limited success in one of these areas.

INSHORE TUNA: Bluefin tuna are usually found in large schools in the Massachusetts-Cape Cod Bay areas from June through October. These schools have supported a growing sports fishery as well as small commercial fisheries for several years.

Small boats had fished surface-swimming bluefin tuna with standard swordfish harpoon-and-keg gear for many years prior to World War II. During that period several enterprising vessel owners also fished subsurface tuna with drifting baited keglines--a precursor to the development of tuna long-line fishing in the area. Since the War, the keg-line method has been largely abandoned, but small boats continue to engage in harpooning surface-swimming tuna on a small scale during June, July, and early August.

Tuna explorations with long-line gear by the chartered schooner *Marjorie Parker* in 1952 and 1953 (Murray 1953, 1954) indicated that appreciable tuna stocks were

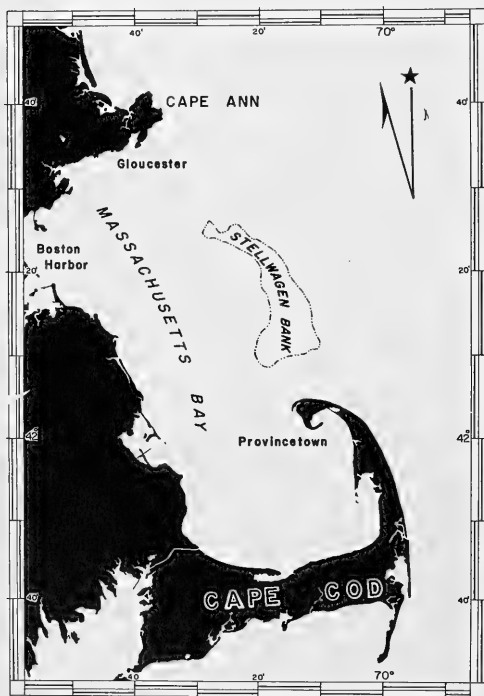


Fig. 1 - The Massachusetts Bay-Stellwagen Bank area. Small-boat long-line tuna operations are conducted in this area during a 3-month season beginning in August.

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^{1/}Long-line gear belonging to the U. S. Bureau of Commercial Fisheries was made available to commercial vessels in a cooperative agreement designed to encourage establishment of the fishery and to add to the knowledge of the resource by the collection of data to supplement that recorded aboard Bureau vessels.

present in waters off New England, but heavy shark damage during those years discouraged initiation of a tuna long-line fishery at that time.

Commercial operations utilizing purse-seine gear have also been attempted several times during the past 20 years (Murray 1952), but substantial production of tuna by this means has been attained only recently. In the summer of 1958 the 62-foot converted shrimp trawler *Silver Mink* of Provincetown, Mass., produced 179 tons of bluefin tuna in a 73-day season (Squire 1959), and in 1959 the vessel set a new East Coast record for production of purse-seine caught tuna when 750 tons were landed in a 56-day season. The accessibility of the fishing areas to Provincetown was significant in the success of the *Silver Mink*. The majority of the operations were carried out in the immediate vicinity of Cape Cod, within a day's run to and from Provincetown. The fishing areas included Cape Cod Bay and Stellwagen Bank.

The Cape Cod Bay trap-net fishery, although not a large-scale segment of the tuna fishery, has accounted for considerable numbers of school tuna each season, particularly during the months of July and August. Three traps set for mackerel on August 5, 1948, impounded 336 tuna weighing a total of 75,000 pounds (Bigelow and Schroeder 1953).

Although the presence of tuna schools on the surface has been evident to sports and commercial fishermen for many years, the occurrence and movements of subsurface-swimming bluefin tuna have remained largely matters of conjecture. One of the best indications, to date, of the continued occurrence of these subsurface fish has come from long-line operations conducted recently on the 15- to 20-fathom northern edge of Stellwagen Bank (Middle Bank). The long-line catches indicate that subsurface bluefin tuna schools occur in the inshore area from mid-June to the end of October.

Inshore long-line fishing originated shortly after the end of World War II when the keg-line- and the halibut-line-trawl were combined and modified to form a prototype of the tuna long-line gear now in use on Stellwagen Bank. Gear used since then has been similar in principal, but has differed in construction with the ideas of the individual fishermen, the number of men used to operate the gear, and the availability of material.

Small-boat long-lining operations on Stellwagen Bank, in contrast with trap fishing and purse-seining, require only a fraction of the investment for vessels, gear, and crew. In addition, the long-line vessels can be converted readily to other types of seasonal fishing and can, thus, supplement the income of the owners and operators. For example, long-lining during June, July, and early August is hindered by the presence of large numbers of dogfish (*Squalus acanthias*) which often strip the long-line gear of bait. The local small boats, therefore, conduct harpooning operations until the dogfish move off the Bank in mid-August and the commercial long-line fishery, which continues through October, can be initiated. Estimated daily operating costs, based on figures obtained from 3 small Gloucester long-line boats, range from 15 to 20 dollars each.

EQUIPMENT AND METHODS

Typical of the small boats operating in the inshore long-line fishery is the *Julie Ann*, a Nova Scotia lobster boat, 40 feet in length with an 11-foot beam (fig. 2). Built in 1946, the *Julie Ann* has been fishing tuna from mid-June to the end of October since 1954. This boat normally converts from harpoon fishing to a single-man long-line operation at the end of August. On an aver-



Fig. 2 - The Gloucester tuna long-line boat *Julie Ann*.

age day's fishing, within 30 miles from Gloucester, a single basket (box) of gear is set. In a 4-hour fishing period the main line is under-run through a snatch block at the side of the pilothouse from 1 to 3 times depending on the size of the catch, number of snags, or amount of bait loss. Hooked tuna are gaffed and hauled aboard either by hand or with a double block. Manila branch lines^{2/} are weighted with three 2-ounce seine weights and attached to the steel-cable leaders by 1 $\frac{1}{4}$ -inch heavy-duty brass swivels. Japanese-style tuna hooks are bent to the leaders by crimped nico-press sleeves. Double-size lobster-pot buoys, 5-gallon cans, kegs, and groups of 2 trawl-net floats are used alternatively for buoys on the drop lines; and a standard-size steel beer keg buoys each end of the main line and the upper ends of the 25-fathom anchor lines. An improvised 25-pound mushroom anchor made from a truck wheel on one end of the long-line, and a 30-pound kedge anchor on the other end, holds the long line in fishing position. Depth recorder and portable RDF serve to locate fishing areas on the Bank.

Fig. 3 - Baiting a branch line with butterfish aboard the *Julie Ann*. Box contains a 200-fathom main line with 40 hooks.

The Gloucester boat *Here We Go*, also of Nova Scotia design (36 feet in length with an 11-foot beam), was built in 1950 (fig. 5). The vessel

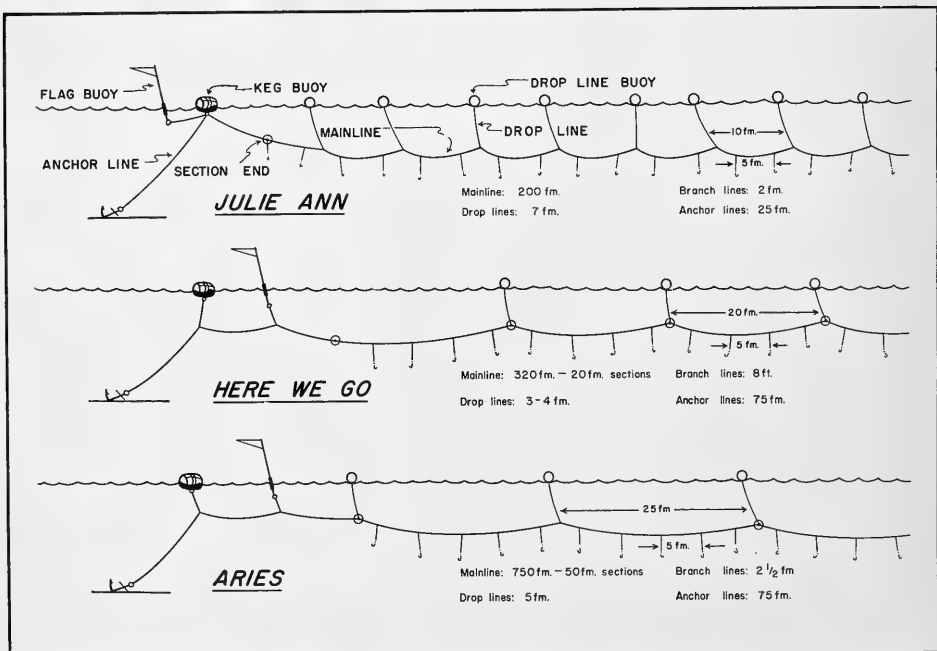


Fig. 4 - Diagram of long-line gear used by three Gloucester boats fishing for bluefin tuna on Stellwagen Bank. (Not drawn to scale.)

^{2/}The branch lines are referred to in the New England area as "gangings"—a term derived from the halibut line fishery. In some other areas, this term apparently has been corrupted to "gangions."

owner, long-lining bluefin tuna since 1947, fishes alone. The main line is tended with the help of a lobster davit, which is equipped with an open snatch block, and a small winch head. Fish are hauled aboard over a side-rail roller. Long-line gear (table 1 and fig. 2) is set at 5 fathoms and worked 4 hours with 2 to 3 under-runs. Chum is utilized, when available, with reported success. Drop lines are spliced into the main line every four hooks and these are buoyed by seine-cork bobber sets, supplemented every sixteen hooks by a standard swordfish keg. The leaders are crimped to the gangings by nico-press sleeves, with intermediate heavy-duty brass swivels. Japanese-style 14/0 extra-heavy giant tuna hooks are also attached to the leader by nico-press sleeves. Fifteen-pound kedge anchors on 75-fathom anchor lines at each end of the set stretch the main line in a fishing position. A 15-gallon oil drum buoys the anchor line on a 4-fathom drop line attached 20 fathoms from the end of the main line. A flag buoy, also on a 4-fathom drop line, is placed on the anchor line 10 fathoms from each end of the main line. Supplementary equipment consists of radiotelephone, depth-recorder, and a 12-volt electric tuna shocking device used in surface-trolling operations.



Fig. 5 - Baskets of long line used on the Gloucester boat *Here We Go*. Two baskets are set to make a 320-fathom main line with 64 hooks. Note seine-cork bobber sets used as drop line buoys.

Gear	Table 1 - Small-Boat Tuna Long-Line Gear Used on Stellwagen Bank			
	<i>Julie Ann</i>	<i>Here We Go</i>	<i>Aries</i>	<i>Marjanna II</i>
Baskets:				
Construction and type	Wood, box 14x18x40 inches	Wood, trawl tub 2-bushel capacity	Wicker, garden basket, 3 bushel	Galvanized metal No. 2 tub.
Number fished	1	2	3	15
Mainline:				
Type	6-thd. synth.	5" 16 synth.	5" 16 synth.	11" 64 synth.
Length/basket	200 fm.	160 fm.	250 fm.	138 fm.
Sections/basket	1	8	5	1
Drop Lines (float lines):				
Type	6-thd. manila	14 lb. ground trawl or 6-thd. synth.	6-thd. synth.	11" 16 synth.
Number/basket	21	8	10	1
Length	7	3-4 fm.	5 fm.	5 fm.
Branch Lines (gangings):				
Type	6-thd. manila	3" 16 synth. gill net maitre line	5" 16 synth.	11" 16 synth.
Number/basket	40	32	50	1/
Length	11 fm.	3 ft.	1 fm.	3 fm.
Leaders:				
Type	3" 32 galv. steel cable	3" 32 galv. steel cable	3" 32 galv. steel cable	3" 32 stainless steel wire
Length	81-24"	5 ft.	11 fm. 2	1 fm.
Tuna Hooks:				
Size	9/0	14/0	12/0, 9/0	9/0
Anchor Lines:				
Type	6-thd. manila	6-thd. synth.	9-thd. synth.	None
Length	25 fm.	75 fm.	75 fm.	None
1/5 baskets with 20 gangings and 10 baskets with 10 gangings.				

The ex-Coast Guard buoy tender *Aries* (38 feet in length with a 12 foot beam) was built in 1945 and has been used for long-lining tuna since 1947 (fig. 6.). On a 4-hour set the main line is under-run through an open snatch block on a lobster davit 2 to 3 times by a 2-man crew,

and fish are hauled aboard with a winch head and a block on the side of the pilothouse. The gangings are spliced into the main line 5 fathoms apart with leaders, swivels and Japanese-style tuna hooks attached by crimped nico-press sleeves. Kedge anchors, weighing 25 pounds each and located at the ends of 75-fathom anchor lines, are used to spread the set. Two 40-fathom drop lines are attached to each anchor line. The first, attached at a distance of 10



Fig. 6 - Long-line gear aboard the *Aries* out of Gloucester, Mass. Three baskets are fished to make a 750-fathom main line with 150 hooks. Note rubber mackerel lure on center basket.



Fig. 7 - Bureau of Commercial Fisheries' long-line tubs aboard the small Gloucester trawler *Marianna II*.

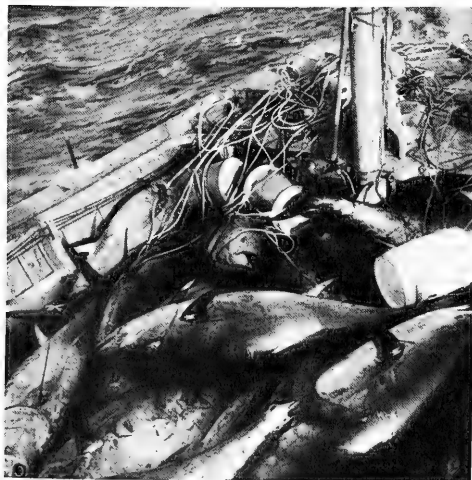


Fig. 8 - A few of the 40 bluefin tuna taken in a $3\frac{1}{2}$ -hour set made from the *Julie Ann*. The catch rate for this set was 57.1 bluefin tuna per 100 hooks baited.

³See footnote 1.

feet from the end of the mainline, bears a flag buoy; the second, positioned 20 feet from the end of the main line, terminates in a 20-gallon keg buoy.

Using long-line gear obtained on loan from the Bureau of Commercial Fisheries³ (Bullis and Captiva, 1955), the small Gloucester trawler *Marianna II* (fig. 7) fished for bluefin tuna on September 26, 27, and 28, 1959. A single 15-basket set was made each day at 7 a.m. and gear was hauled aboard at 5 p.m. On two occasions the gear was under-run from a skiff and the main line was pulled by hand.

Bait used by the three vessels was not restricted to any one fish. Blueback herring, menhaden, mackerel, whiting, and butterfish are said to fish equally well, on the hook or when used for chum. Daily bait requirements on the *Julie Ann* are approximately 50 pounds, whereas the *Here We Go* and the *Aries* need from 200 to 500 pounds each to chum. The cost ranges from 1 to 3 cents a pound. Availability of bait for these operations has been dependent upon the catches of Gloucester-

ter trap boats, dragners, and seiners. Although availability of fresh bait fish has been no problem, practical use of fresh bait has been prevented by the dogfish shark population on Stellwagen Bank during the early part of the season. On one occasion the Aries used a rubber mackerel lure with success (fig. 6).

Catch records for small commercial craft are sketchy, but the annual catch (for the 3-months fishing season) of three commercial boats fishing the inshore area is estimated roughly to exceed 30 tons per boat. Catch rates varied with the individual boat, areas fished, and other factors. On September 30, 1959, the operator of the Julie Ann achieved a catch rate of 57.1 fish per 100 hooks baited when 40 bluefin tuna were taken in the course of a 3½-hour set consisting of 1½ under-runs. Total weight of the catch was estimated at 5,255 pounds (fig. 8.). Throughout the season, catch rates for the other two boats fishing the same area were estimated at between 30 and 40 fish per 100 hooks baited; and, in September, the small trawler Marianna II, fishing in a nearby area, averaged 15.4 fish per 100 hooks baited in the course of a 3-day fishing period. Total catch for the period was 139 bluefin weighing 14,000 pounds dressed.

Only 7 sharks were taken on the Marianna II's gear during this 3-day period. This represents a catch rate of only 0.78 sharks per 100 hooks, and no shark damage was noted. Information from other boats indicated that few sharks were taken on long lines and no shark-damaged tuna were recorded. This is in sharp contrast with the reports of shark damage incurred while long-lining in inshore waters during the 1952-53 seasons (Murray 1953, 1954).

CONCLUSIONS

The success of long-line tuna operations on Stellwagen Bank indicates the feasibility of expanding the present small-boat tuna fishery within the Massachusetts Bay area, and the possibility of establishing similar fisheries in other selected areas off northeastern United States. The size of the vessels, low operating costs, small crews, and ability to convert readily to other types of fishing, are positive advantages of these operations.

The present short season in the Stellwagen area might be extended by developing a suitable artificial lure to overcome the dogfish problem.

Further evaluation of seasonal bluefin stocks and fishing methods on inshore waters could contribute substantially to an expansion of this fishery in the New England area.

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TRENDS AND DEVELOPMENTS

American Fishery Advisory Committee

INTERIOR DEPARTMENT REAPPOINTS SIX TO COMMITTEE:

Six members of the American Fisheries Advisory Committee whose terms expired on June 30, 1960, have been reappointed to 3-year terms beginning July 1, Assistant Secretary of the Interior Ross Leffler announced July 6, 1960.

The appointees are: Ralph E. Carr, President, Mid-Central Fish Co., Kansas City, Mo.; Chris Dahl, Kayler-Dahl Fish Co., Petersburg, Alaska; H. R. Humphreys, Jr., President, Standard Products Co., White Stone Va.; Leon S. Kenney, President, Pinellas Seafood Co., St. Petersburg, Fla.; James McPhillips, Vice President, Southern Industries Corp., Mobile, Ala.; and Arthur H. Mendonca, President, F. E. Booth Co., Inc., San Francisco, Calif. Kenney and Mendonca have served with the Committee since it was organized on February 14, 1955. There were then 19 members; later, this number was raised to 20.

Authority for the creation of the Committee is carried in the Saltonstall-Kennedy Act of 1954. The purpose of the Saltonstall-Kennedy Act is to promote the free flow of domestically-produced fishery products in commerce, to develop and extend markets, and to assure necessary research.

The original Advisory Committee was considered to be temporary since the life of the legislation was only three years. In 1956, however, the Fish and Wildlife Act extended the Saltonstall-Kennedy legislation indefinitely. The committee acquired permanent status effective July 1, 1957. The rules governing appointments provide for a basic 3-year term for members and permit one 3-year reappointment. One-third of the membership is changed each year.

The Committee will hold its next meeting in the Olympic Hotel, Seattle, Wash.,

August 10-12. Assistant Secretary Leffler is the Chairman. At these meetings, it is customary for the Bureau of Commercial Fisheries to review its activities and to outline its future plans. The Committee advises the Secretary and the Bureau of Commercial Fisheries in the formulation of policy, rules, and regulations pertaining to requests for assistance under the terms of the Saltonstall-Kennedy Act, and other matters.

Besides the six members reappointed, the Committee consists of: William P. Ballard, President, Ballard Fish and Oyster Co., Inc., Norfolk, Va.; Lawrence Calvert, President, San Juan Fishing and Packing Co., Seattle, Wash.; Harold F. Cary, Van Camp Seafood, Inc., Long Beach, Calif.; Ray H. Full, Treasurer, Kishman Fish Company, Vermilion, Ohio; David H. Hart, fisherman and boatowner, Cape May, N. J.; J. W. Lewis, President, Twin City Fishermen's Cooperative Association, Inc., Morgan City, La.; Donald P. Loker, Star-Kist Foods, Inc., Terminal Island, Calif.; J. Richard Nelson, F. Mansfield and Sons Co., New Haven, Conn.; Moses B. Pike, General Manager, Holmes Packing Corp., Eastport, Maine; Harry F. Sahlman, Sahlman Sea Foods, Fernandina Beach, Florida; Arthur S. Sivertson, Sivertson Bros. Fisheries, Duluth, Minn., and Lawrence W. Strasburger, technological consultant, Metairie, La. There are two vacancies on the Committee.



American Samoa

TUNA LANDINGS, JUNE 1960:

Landings of tuna by Japanese, South Korean, and native long-line vessels at the United States-owned tuna cannery in American Samoa totaled 2,944,000 pounds in June 1960, an increase of about 39.5 percent from the 2,111,000 pounds landed in June a year ago. For the first six months of 1960 landings amounted to 13,552,000 pounds as compared with 12,196 pounds landed the same period of 1959.

American Samoa Tuna Landings, June 1960 and January-June 1960				
Species	June		January-June	
	1960	1959	1960	1959
Albacore	2,061	1,533	11,058	9,078
Yellowfin	197	459	1,429	2,514
Big-eyed	686	119	1,055	604
Skipjack	1/	—	10	1/
Total	2,944	2,111	13,552	12,196

1/ Less than 500 pounds.



California

COLORED LIGHTS FOR ATTRACTING FISH AND NEW METHOD OF SETTING SAMPLING NETS TESTED:

M/V "Alaska" Cruise 60A5-Pelagic Fish:
The coastal waters off southern California from San Pedro to Palos Verdes Point, and Santa Catalina Island were surveyed (May 16-June 4, 1960) by the California Department of Fish and Game research vessel Alaska to test the effectiveness of several types of lights for attracting fish, and to experiment with new methods of setting fish-sampling nets.



California Department of Fish Game's research vessel M/V Alaska.

Tests were conducted on 28 stations to determine the relative effectiveness of fish attraction of underwater colored lights compared with the regular 1500-watt incandescent standard sampling light. A 500-watt underwater lamp with interchangeable colored filters was used. The two lamp types were used separately on alternate stations. Stations were located in clear water where fish were known to be present.

At 22 of the 28 stations a blue lens was used alternating with the standard 1,500 watt lamp. The blue lens attracted sardines on 2 of the 11 stations at which it was used, jack mackerel on 2, and Pacific mackerel on 1. The standard light attracted sardines on 5 of the 11, jack mackerel on 2, Pacific mackerel on 1, anchovies on 1, bonito on 1, and atherinids on 4.

In the remaining 6 tests, an underwater amber lens attracted sardines on 1 of the 3 stations at which it was used. Sardines were also attracted to 1 of the 3 alternate standard light stations.

To test the effectiveness in catching fish under different colored lights, fish were attracted with a surface light, an underwater light was then turned on and the surface light extinguished. Observations of fish behavior were then made. On each station the amber, blue, clear, and red lenses were used. Fish behavior was not noticeably altered by the amber, blue, or clear lenses. A milling school of sardines or anchovies under the surface light continued to mill in the same pattern when the underwater lamp was lighted and the surface light extinguished. When the red lamp was turned, sardines, in each case, left the red light zone. Reaction to the red-light may have been a function of low light intensity rather than a response to the red color. Sardines did not avoid the red light zone when an overhead incandescent lamp was turned on simultaneously.

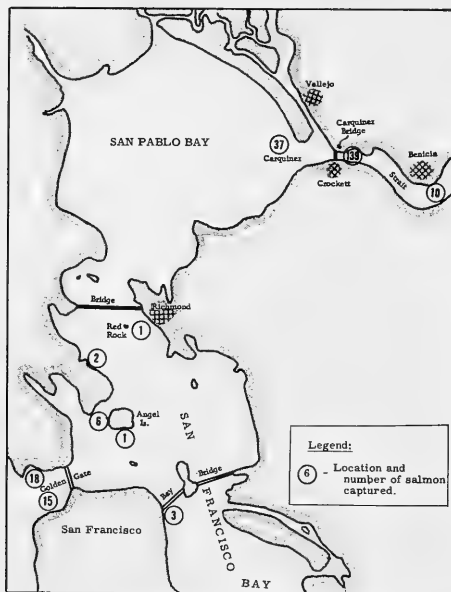
None of the underwater lenses tested altered fish behavior to the extent that it made them more susceptible to capture. However, when sardine or anchovy schools were given a preference, invariably they were attracted to the brightest light source.

A sampling gill net was set on 5 schools of "wild" sardines which were extremely difficult to catch with the blanket net. Sardines were obtained in each set. The degree of "wildness" in sardines varied between schools. The presence of bonito, barracuda, sharks, and other predators considerably increased the degree of "wildness" in a school.

* * * * *

NEW MIDWATER TRAWL NET TESTED ON SALMON FRY:

M/V "Nautilus" Cruise 60N4: An experiment with a new midwater trawl net (15 feet square



M/V Nautilus Cruise 60N4 (June 2-9, 1960).

opening by 65 feet long) for capturing salmon fry was conducted (June 2-9, 1960) by the California Department of Fish and Game research vessel Nautilus in outer San Francisco Bay, from Bonito Point to Benicia in Carquinez Strait. Other objectives of the survey were to determine at what depths salmon are located and in what areas, and to recover as many marked salmon as possible.

The Nautilus completed 44 tows with the mid-water trawl net. A total of 232 salmon fry was captured. Of these, 6 were marked (salmon released in Sacramento River earlier this year)--4 dorsal right ventral fin-clipped fish released into the River at Rio Vista and 2 dorsal left ventral fin-clipped fish released into Battle Creek.

Trawling was done at various depths and distances from shore. Small salmon were found in all areas tried. Largest numbers were taken very near the surface. They were found to be distributed at various distances from shore.

The trawl net was a small copy of a net developed in 1953. Its mouth was held open by 4 doors $1\frac{1}{2}$ feet x 2 feet, acting as kites. Some trawls were made with 2 small otter doors placed 75 feet forward of the quarter doors. This made the net fish slower and deeper than it did without otter doors. Only 20 salmon were caught with this method. All remaining salmon were caught with quarter doors while fishing on the surface. Average towing speed was between 4 and 5 miles

per hour. At this speed the net's mouth was forced together slightly by pressure. This reduced the effective fishing area of the net to about 9 square feet.

The 2 most common species taken were northern anchovy, Engraulis mordax (about 900 pounds of 1-5-inch fish) and herring, Clupea pallasii (about 200 pounds of 2-6 inch fish). Other fish taken in small numbers were: striped bass, Roccus saxatilis; jack smelt, Atherinopsis californiensis; starry flounder, Platichthys stellatus; shad, Alosa sapidissima; split-tail, Pogonichthys macrolepidotus; California pompano, Palometa simillima; a few species of family Embiotocidae; and a few young fresh-water smelt and greenling sea trout.

* * * * *

PELAGIC FISH POPULATION SURVEY CONTINUED:

Airplane Spotting Flight 60-12-Pelagic Fish: The inshore area from the California-Mexican border north to Bodega Bay was surveyed from the air (June 15-17, 1960), by the Department's Cessna "180" 3632C to determine the distribution and abundance of pelagic fish schools.

Low clouds and fog prevailed over most of the California coast during the five days scheduled. The ocean was visible in only two areas north of Point Dume: from Carmel to Cape San Martin, where no schools were seen; and a small section at the south end of Bodega Bay where about 25 anchovy schools were found.

During one day when fair conditions of visibility prevailed, it was possible to scout the extreme inshore area from Point Vicente to the Mexican border; no schools were seen.

Red tide was observed in the San Pedro end of Los Angeles-Long Beach harbor and along the beach from Malibu to Ocean Park.

Note: Also see Commercial Fisheries Review, Aug. 1960, p. 14.



Canned Sardines

MARKETING STUDIES SHOW CONSUMER BUYS ON IMPULSE:

A sizable amount of canned sardines marketed in the United States are purchased by consumers on impulse. This is one of several findings of a survey of consumer attitudes toward canned sardines which are included in a report entitled Who Buys Canned Sardines, and Why.

The new U. S. Bureau of Commercial Fisheries report is based on a survey of the factors that motivate consumer preferences for canned sardines, conducted by a research firm under a contract from the Bureau.



The survey found that among the users of sardines, 12 percent in Boston, 21 percent in Birmingham, Ala., and 31 percent in Detroit bought sardines on impulse. When asked what would induce them to use more sardines, about one-fifth of the household consumers said that they eat sardines often enough; in addition, 46 percent in Boston, 27 percent in Birmingham, and 21 percent in Detroit stated that nothing would induce them to use more sardines. However, 17 percent in Birmingham and 15 percent in Detroit stated that a lower price would increase their buying. Only 4 percent in Boston mentioned price. Removal of bones, and/or removal of skin were also mentioned as inducements for greater use by about 20 percent of the consumers interviewed in Detroit, 10 percent in Boston, and 8 percent in Birmingham.



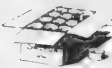
Cans--Shipment for Fishery Products, January-May 1960

Total shipments of metal cans during January-May 1960 amounted to 49,682 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 43,046 tons in the same period a year ago. The increase of about 15.4 percent in the total shipments of metal cans January-May this year as compared with a similar period of 1959 was probably



due to early orders in anticipation of a sharp increase in the Alaska canned salmon pack.

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.



Central Pacific Fisheries Investigations

FLUCTUATIONS IN HAWAII'S SKIPJACK TUNA CATCH MAY BE DUE TO CHANGES IN OCEANIC CIRCULATION:

Biologists and oceanographers of the Honolulu Biological Laboratory of the U. S. Bureau of Commercial Fisheries are attempting to learn the reasons for the wide annual fluctuations in the skipjack catch from Hawaiian waters. Briefly, they assume that the changes in catch are related to changes in the oceanic circulation or flow of water. One aspect of this circulation which appears to be important is the California Current Extension which flows toward Hawaii from off the California coast. To better understand this feature of the oceanic circulation, scientists from the Bureau of Commercial Fisheries Honolulu Biological Laboratory undertook a series of five cruises during 1959 covering an area between 12° and 25° N. lat. and 145° and 170° W. long., approximately 1 million square miles of ocean.

The results of these cruises show that the circulation changes substantially during the year. In the winter, the flow of western North Pacific water effectively bars the California Current water from entering the island area. As the year progresses, the strength of the California Current increases and during spring and early summer this water gradually pushes into and beyond the Hawaiian Islands. In mid-summer the western North Pacific system increases in strength and again gradually replaces the California Current water around the islands. This process of the advance and retreat of the California Current Extension is apparently an annual occurrence, although the extent and time of the advance may vary from year to year.

Records of the bird flocks and fish schools seen during the five cruises afford some ideas as to the relation between the environment and the distribution of tunas. Fish were also caught by pole-and-line fishing and by long-

line gear. Skipjack were considerably more abundant to the southwest of the Hawaiian Islands than to the east. They also appeared to be more abundant near the boundaries between the western North Pacific water and the California Current Extension. Long-line catches varied considerably among cruises, with the best catches taken during the winter months.

How the changes in circulation affect the Hawaiian skipjack fishery is still unknown. One hypothesis is that the fish use the California Current Extension as a guide or signpost in their migrations. These migrations may be for the purpose of reaching feeding areas or areas favorable for reproduction. Plankton collections made during the 1959 cruises do not show that any of the areas surveyed are especially rich in food. Because of this it appears more likely that skipjack may migrate in the Hawaiian area because conditions are suitable for spawning and survival of young. Examination of the plankton collections for skipjack larvae, a time-consuming and tedious task, is in progress. Results of these examinations should show whether more spawning takes place in certain areas than in others.

Cruises to the east and southwest of the Hawaiian Islands will be made during 1961. On those cruises we hope to learn more about the relation between skipjack and their environment in the central Pacific.



Chesapeake Bay

COAST AND GEODETIC SURVEY TO ASSIST IN DEVELOPMENT OF FISHERY RESOURCES:

A dual purpose survey of the Chesapeake Bay, scheduled to start early in July 1960, was announced by the U. S. Coast and Geodetic Survey. That agency will undertake a 1,500-mile shoreline survey in cooperation with the Maryland Department of Tidewater Fisheries.

The Coast and Geodetic Survey Director said that the project will provide 37 special shoreline maps for Maryland to assist in their study and development of fishery resources--especially oyster cultivation. In addition, the Survey will revise about 80 of its own large-scale base maps of the Bay with the aerial photography and field data thus acquired. Both Maryland and the Federal Government will

share the expense of this project, which is expected to cost about \$120,000.

An aerial photographic mission started flights during the first week of July near the mouth of the Potomac River. The photography will be accomplished in two distinct phases. Black-and-white film will be used for the revision of land details on the maps, and infrared film employed to emphasize shoreline detail at a mean high stage of the tide. Photogrammetrists know that infrared rays are absorbed by water; thus using this special film, water areas on infrared photographs become black, in sharp contrast to land details. All shore-line photography will be taken when the tide reaches a predetermined level--that of mean high water, and consequently, details can be interpreted from the photography and mapped by rapid office methods without the expense of extensive field surveys.

Two crews will work in the field, locating existing triangulation stations and selecting and identifying prominent objects and marks to be mapped. These alongshore objects will be used by the Department of Tidewater Fisheries as survey points from which they can divide and study the offshore oyster bars and other areas of interest to the seafood industry of Maryland. Many of these "landmarks" will also be included on future editions of nautical charts of the Bay, because of their special interest to the mariner.

Office phases of this project will include "measurement" of the photographs in precision instruments, such as the stereoplanigraph, to control the mapping operation; a careful study of all photography and the revision of existing maps; compilation, scribing or engraving of new map copy; and printing of special maps for the Department of Tidewater Fisheries.

Cooperation between Maryland agencies and the Coast and Geodetic Survey has been commonplace for many years. In 1906, for example, a joint survey was begun of the Chesapeake Bay under the direction of the now defunct Maryland Shellfish Commission. The Survey, between 1906 and 1912, produced 42 detailed oyster charts for the Commission. The Maryland Oyster Survey used these charts with considerable success through the years.

In the period from 1935 until 1945, the Coast and Geodetic Survey completed a new series of planimetric and topographic base

maps of the Chesapeake Bay coastal areas. Aerial photography and field surveys accomplished in 1960 will be used to revise the base maps, and provide most of the source material for the construction of the special maps for the State of Maryland.

The result of this new cooperative survey is expected to be of significant value to the fishing industry.

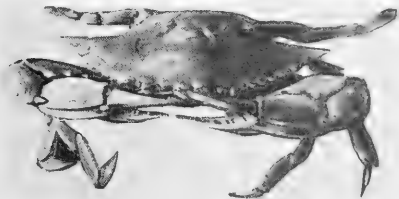


Crabs

CHESAPEAKE BAY SHORTAGE ENDED:

The shortage of blue crabs which has plagued Chesapeake Bay crab fishermen and processors of crab meat since January 1960 will end by mid-summer, scientists at the Virginia Fisheries Laboratory, Gloucester Point, reported on July 11.

The biologist in charge of the crab research project at the Laboratory reports that at least three times as many soft and peeler crabs were caught in June of this year as were landed in the same period in 1959. "This verifies again our belief that a large supply of crabs was produced from spawning in mid-summer 1959," he stated. Numerous finger-nail-sized crabs were caught in November 1959, during one of the Laboratory's regular monthly surveys.



Blue Crab

"Soft and peeler crabs should remain abundant through August," the biologist predicted, "and crab-potters will have above average catches throughout August and this fall; the winter dredge catches will be larger than usual in 1960/61. Hard crab catches by pots and peeler catches with scrapes and fykes should remain high during the spring and early summer of 1961, barring the unforeseen."

Predictions of catches a year in the future are based on observations of the number of

small crabs caught with an experimental trawl by the Pathfinder, the Laboratory's research vessel, and from reports of the hard and peeler crabs caught by commercial crabbers.



Films

FISHING ON GREAT LAKES SUBJECT OF NEW INTERIOR FILM:

The romance of "fishing on the lakes" will be portrayed in a sound-color motion picture now in production, the U. S. Department of the Interior announced July 10, 1960. Fishery activity on all the Great Lakes will be documented. Because so much of the material in the film is of a seasonal nature, the actual filming will require more than a year. The picture will be ready for distribution on a free-loan basis in about a year and a half.

The commercial fisheries picture, sponsored by the Outboard Marine Corporation, is being produced and will be distributed by the Bureau of Commercial Fisheries, Fish and Wildlife Service.

This is the second commercial fisheries film sponsored by the Outboard Marine Corporation and produced by the Bureau of Commercial Fisheries as part of the Bureau's policy of working cooperatively with the industry in the production of fishery educational films. The first, Outboard Fisherman USA, received wide acclaim in this country and won awards at the Edinburgh, Scotland, Film Festival in 1956.

Two additional films more recently produced by the Bureau were exhibited at the Columbus, Ohio, Film Festival and received the Chris Awards from the Film Council of Greater Columbus. These were Salmon-Catch to Can sponsored by the Canned Salmon Institute and Outdoor Fish Cookery, a Bureau-financed production.

The Bureau of Commercial Fisheries is currently producing a picture for the natural sponge industry. This picture is sponsored by the Sponge and Chamois Institute and the sponge industry of Tarpon Springs, Fla.



Fisheries Loan Fund

FISHERIES LOANS

APPROVED FISCAL YEAR 1960:

During fiscal year 1960 (July 1, 1959 to June 30, 1960), applications for fisheries loans totaling 190 and valued at \$5,328,956 were received by the U. S. Bureau of Commercial Fisheries. Of the total, 105 applications for \$2,220,024 were approved and 65 applications for \$1,927,302 were declined or found ineligible. Funds are available for additional loans, and new applications will be processed promptly.

From the beginning of the program in December 1956 through June 30, 1960, a total of 777 applications for \$24,231,119 have been received. Of these, 422 (\$9,933,257) have been approved, 267 (\$7,369,502) have been declined or found ineligible, 66 (\$4,231,122) have been withdrawn by applicants before being processed, and 22 (\$1,622,687) are pending. Of the applications approved, 157 were approved for amounts less than applied for--the total reduction was \$1,074,551.

The following loans were approved during April, May, and June of 1960:

New England Area: Archie M. Alley, Jr., Beals, Me., \$3,500.

South Atlantic and Gulf Area: Edgar J. Taylor, Ft. Myers, Fla., \$12,500; Trawler Austin, Inc., Tampa, Fla., \$21,667; and Mike Gianaras, Tarpon Springs, Fla., \$3,000.

California: Walter T. Cramer, Eureka, \$17,742; Fern D. Henry, Lakeside, \$6,425; The Ambrose Co., Vessel Ronnie S., San Diego, \$120,000; The Ambrose Co., Vessel Wiley V. A., San Diego, \$110,000; Daniel A. Marks, et al, M/V South Coast, San Diego, \$80,000; Malcolm S. Rice, et al, M/V American Enterprise, San Diego, \$80,000; and George Collins, Trinidad, \$6,500.

Pacific Northwest Area: Alex C. Prankard, Olympia, Wash., \$1,250; Ludvik M. Dahlberg, Seattle, Wash., \$23,000; Ola Hendricks, Seattle, Wash., \$14,489; Hans Hoddevik, Seattle, Wash., \$60,000; Ottar G. Larsen, Seattle, Wash., \$8,000; Commander, Inc., Tacoma, Wash., \$75,475; and Seafarer, Inc., Tacoma, Wash., \$61,971.

Alaska: George Hippert, Ketchikan, \$4,900; Emil Christoffersen, Kodiak, \$7,000; William F. Love, Petersburg, \$1,500; Henry A. Nelson,

Petersburg, \$1,500; Dez Gunderson, Seldovia, \$12,000; Theodore Pederson, Seldovia, \$9,000; and Joseph E. Redington, Wasilla, \$3,000.

Hawaii: KHH Fishing Co., Hilo, \$3,250.

Note: See Commercial Fisheries Review, June 1960 p. 26, May 1960 p. 20, March 1960 p. 21.



Fishing Vessel Mortgage Insurance

NEW PROGRAM STARTED:

A new program (Public Law 86-577) to insure mortgages which are given to assist in the construction, reconstruction, and reconditioning of fishing vessels has been started. Assistant Secretary of the Interior Ross Leffler announced on July 9, 1960. This new program will operate similarly to the mortgage insurance on houses which is provided by the Federal Housing Administration.

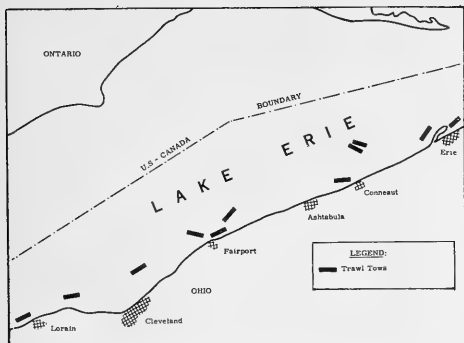
Under this plan the U. S. Department of the Interior, through its Bureau of Commercial Fisheries, will insure the entire amount of the mortgage, which may not exceed 75 percent of the cost of vessel construction or reconditioning. The mortgage cannot extend more than 15 years nor can it bear interest of more than six percent. The insurance premium will be one percent a year when the face amount of the mortgage represents more than 50 percent of the cost of the work, and $\frac{3}{4}$ of one percent when it is 50 percent or less of the cost.



Great Lakes Fisheries Exploration and Gear Research

SEASONAL DISTRIBUTION STUDIES OF COMMERCIAL FISH STOCKS IN LAKE ERIE CONTINUED:

M/V "Active" Cruise 10: The second in a series of cruises scheduled for Lake Erie was conducted (June 6-16, 1960), by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Active to obtain additional information on the seasonal distribution of fish stocks. Erie will be the new permanent base of operations for the eastern Great Lakes.



M/V Active Cruise 10 (June 6-16, 1960).

Extensive echo-sounding operations conducted from Vermilion, Ohio, to Erie, Pa., failed to locate any large concentrations of smelt. These results were anticipated on the basis of previous records during this time of year in Lake Erie. Trawling was only carried out in restricted areas where echo-tracings gave sufficient indication that commercial quantities could possibly be harvested. Half-hour drags generally caught from 90-130 pounds of medium (15-20 per pound) smelt. Thermal stratification with a sharp thermocline was observed throughout the area. Surface temperatures in the open lake ranged from 55°-68° F.

Note: Also see Commercial Fisheries Review, Aug. 1960 p. 23.

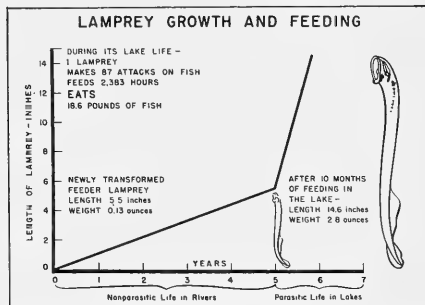


Great Lakes Fishery Investigations

HIGH WATER HAMPERS LAKE SUPERIOR SEA LAMPREY CONTROL PROGRAM:

Electrical devices for control of the sea lamprey were placed in operation in Lake Superior tributaries on schedule this spring, but extreme high water handicapped operations over a 6-week period. It was impossible even to service traps at some installations for periods in excess of 30 days. An attempt was made to keep all devices functioning throughout the flood even though lampreys could bypass the structures. Sea lamprey escapement past the barriers was possible at all installations except Pendills Creek. The most serious damage occurred to the Bad River installation where destruction was so extensive that repair is not planned. In addition to the Bad River, operation of the Big

Garlic River installation ceased on May 29, 1960, as a result of a change in the ownership of the property. Damage to the remaining installations was relatively light.



Control barriers out of operation were repaired as soon as water levels receded and access roads and bridges were passable and 35 control devices are now in operation. Captures of adult sea lampreys totaled 27,869 by June 17. These same control devices caught 42,175 adults during the same period in 1959.

Although the captures to June 17 represent a reduction of nearly 34 percent in the number of adults as compared with the same period of time in 1959, it cannot be considered indicative of the actual population, since no knowledge of the number of sea lampreys that bypass the controlling devices during periods of extensive high water is available. Heavy but unmeasured mortality of adult sea lampreys occurred at some devices during high-water periods.

LAKE MICHIGAN POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 3: The chub (*Leucichthys* sp.) population survey in southern Lake Michigan was continued (June 7-21, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Cisco. Trawl catches during this cruise were generally small. Thirty-minute tows with a 52-foot ballon trawl at 5-fathom intervals from 15 to 35 fathoms, and at 50 fathoms, west-southwest of Grand Haven, Mich., yielded 36 to 272 pounds of chubs. Similar tows at 5-fathom intervals from 15 to 35 fathoms west-northwest of St. Joseph, Mich., took 35 to 235 pounds of chubs. The best catches were at the shallower depths.

Practically all the chubs were bloaters (Leucichthys hoyi). No species other than chubs were taken in significant quantities. The poor trawl catches, also reported by commercial fishermen, suggest that many of the smaller chubs, which usually make up the bulk of these catches, were at midwater levels.



A 39-foot whiting trawl with a small-mesh ($\frac{1}{2}$ -inch stretched) cod end was dragged in 5, 7, and 10 fathoms south of Grand Haven. Catches were predominately alewives and yellow perch at 5 and 7 fathoms and bloaters and yellow perch at 10 fathoms. Also numerous, at 5 and 7 fathoms were smelt, trout-perch, and spottail-minnows; less common were whitefish (2), longnose suckers (1), and log-perch (1). Yearling perch averaged about 3.2 inches, and yearling smelt about 2.6 inches.

Gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -inch mesh, and 300 feet each of 2-, $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) set overnight at 25 and 50 fathoms off Grand Haven, made heavier catches than during cruise 2, except in the smallest ($1\frac{1}{4}$ -inch) mesh. Thus it appears that more of the larger than of the smaller chubs have remained near the bottom. The chubs in the gill nets were about 99 and 95 percent bloaters at 25 and 50 fathoms, respectively. The remainder were L. reighardi, L. zenithicus, L. alpenae, and, at 50 fathoms L. kiyi. Catches included also a few lake herring (L. artedi). L. reighardi has practically completed spawning, which began in late April. Gangs of nylon gill nets set overnight at 25 and 50 fathoms off St. Joseph took fewer chubs than did those off Grand Haven, but at 25 fathoms the percentage of fish other than bloaters was higher. The catch at 25 fathoms was 324 L. hoyi, 6 L. zenithicus, 3 L. reighardi, 2 L. alpenae, and 25 lake herring; at 50 fathoms it was 266 L. hoyi, 2 L. zenithicus, 8 L. reighardi, 2 L. alpenae, 1 L. kiyi, and 3 lake herring.

A gang of linen gill nets consisted of 255 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, and 3-inch mesh and another gang of twice this amount of each mesh size were set off Grand

Haven for 5 nights at 25 and 50 fathoms, respectively. At 25 fathoms the catch consisted of about the same number of bloaters but considerably less of the other chub species than an identical set at the same time of year in 1954. At 50 fathoms the catch was higher for all species than in 1954. Comparisons will have to be made throughout the year, however, before conclusions can be drawn regarding relative abundance in 1954 and 1960.

In order to study the differences in the catches of gill nets set for different lengths of time, and also to learn something of night-to-night variations in catches, gangs of nylon gill nets were fished at 50 fathoms off Grand Haven as follows: on the first day after 4 gangs had been set, one gang was lifted, and reset; the second day the 1-night set and a 2-night set were lifted, and one of the gangs was reset; on the third day no nets were lifted, due to stormy weather; on the fourth day all three remaining gangs were lifted. Thus there were two each of 1-night, 2-night, and 4-night sets. The 1-night set took 553 and 826 chubs, the 2-night sets 1,106 and 1,189, and the 4-night sets 2,002 and 2,000. All mesh sizes except the 2-inch caught nearly twice as many fish in the 4-night sets as in the 2-night sets, so that they apparently were fishing well for the full 4 nights. The 2-inch mesh, which caught considerably more than any other mesh, appeared to have "loaded up" after two nights, however. The catches for this mesh were 325 and 402 in the 2-night sets and 465 and 467 in the 4-night sets.

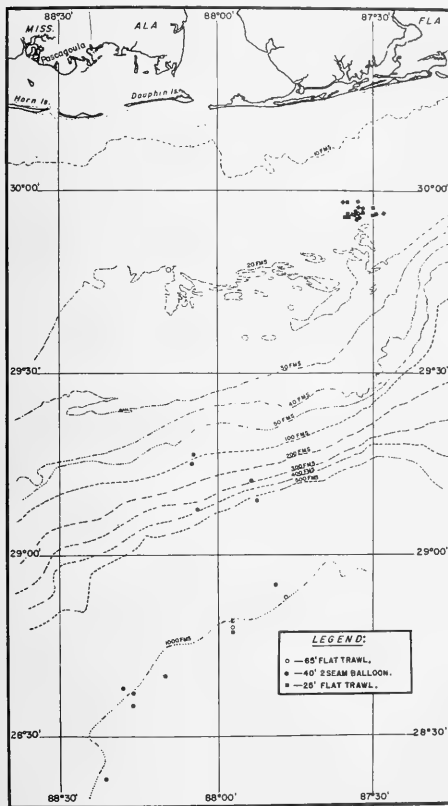
Complete hydrographic observations and collections were made at 25-fathom stations off Grand Haven and St. Joseph. Surface temperatures were lower in a narrow band near shore (mostly 6° to 8° C. -- 42.8° to 46.4° F.) than farther out (mostly 11° to 15° C. -- 51.8° to 59.0° F.) except at the end of the cruise when strong winds partially broke up the thin epilimnion offshore and dropped surface temperatures there to about 8° C. (46.4° F.). Extreme open-lake surface temperatures recorded were 5.4° C. (41.7° F.) and 17.2° C. (63.0° F.).

Gulf Exploratory Fishery Program

DEEP-SEA COMMERCIAL-TYPE
TRAWLING METHODS STUDIED
IN NORTH-CENTRAL GULF:

M/V "Oregon" Cruise 68 Studies of deep-sea trawling methods, which were initiated in

1958, were continued by the U. S. Bureau of Commercial Fisheries' exploratory fishing vessel Oregon during a seven-day cruise that ended on July 18, 1960.



M/V Oregon Cruise 68 (July 12-July 18, 1960.)

A total of 10 drags was attempted along the 1,000-fathom depth contour, using 60-foot and 40-foot shrimp trawls. The major trawling problem was bogging the gear in soft mud bottom, which occurred on six of the drags. Two drags resulted in catches of approximately 50 pounds of fish, crustaceans, and miscellaneous invertebrates. Both catches were heavily coated with lube-oil sludge. Two drags were water hauls.

A series of five drags were made off Mobile Bay between depths of 80 and 575 fathoms. Of particular interest was a 58-pound catch

of unusually large royal-red shrimp from 240-245 fathoms which averaged about 16-18 count (heads-off) per pound.

A 40-bushel sample of calico scallops was caught on the return leg of the cruise. These were brought in whole for shucking tests at the Bureau's Pascogoula Technological Laboratory.

Note: Also see Commercial Fisheries Review, November 1959 p. 38.



Maine Sardines

BOY SCOUTS SERVED SARDINES:

Almost 60,000 Boy Scouts ate 60,000 cans of Maine sardines at their National Jamboree at Colorado Springs during the latter part of July. The Maine Sardine Council donated the sardines to the scouts as a duplicate of a similar operation at the 1957 Jamboree at Valley Forge, Pa.

The sardines were served as the main item of a quick meal as the boys arrived at the site from all sections of the country. The second serving was a farewell snack as they left for home. The cans had a specially-designed cover commemorating the Jamboree.

Last year the Council served Maine sardines to 20,000 Girl Scouts at their National Campfire.

* * * * *

CANNED STOCKS, JULY 1, 1960:

Distributors' stocks of Maine sardines totaled 172,000 actual cases on July 1, 1960, a drop of 2 percent from the 176,000 cases on hand July 1, 1959. Stocks held by distributors on June 1, 1960, amounted to 197,000 cases, and on April 1, 1960, totaled 252,000 cases, according to estimates made by the U. S. Bureau of the Census.



Canners' stocks on July 1, 1960, totaled 359,000 standard cases (100 $\frac{3}{4}$ -oz. cans), a decrease of 63,000 cases (15 percent) as compared with July 1, 1959. Stocks held by canners on June 1, 1960, amounted to 235,000 cases and on April 1, 1960, amounted to 397,000 cases.

Table 1—Canned Maine Sardines—Wholesale Distributors' and Cannery Stocks, July 1, 1960, With Comparisons^{1/}

Type	Unit	1959/60 Season					1957/58 Season				
		7/1/60	6/1/60	4/1/60	1/1/60	11/1/60	7/1/59	6/1/59	4/1/59	1/1/59	11/1/58
Distributors	1,000 actual cases	172	197	252	235	296	176	197	254	268	312
Cannery	1,000 std. cases ^{2/}	359	235	397	843	1,001	422	272	474	891	1,037

^{1/}Table represents marketing season from November 1-October 31.

^{2/}100 $3\frac{1}{2}$ -oz. cans equal one standard case.

The 1960 pack (from the season which opened on April 15, 1960) as of July 23 was about 677,000 standard cases as compared with 673,000 cases packed in the same period of 1959. The April 1, 1960, carryover was about 335,000 cases, substantially lower than the carryover of 420,000 cases on April 1, 1959.



Marketing

EDIBLE FISHERY PRODUCTS MARKETING PROSPECTS, SUMMER 1960:

United States civilian consumption of fishery products in the summer and fall of 1960 was expected to continue close to that of a year earlier. Supplies of the processed items were expected to remain lower than a year ago until marketings of the 1960 pack of the canned commodities started in volume during late summer. Retail prices of fish and shellfish may average a little lower this summer and early fall than last.

Commercial landings of food fish and shellfish are now at the season's peak. The annual total for this group may be higher than in 1959, when the catch of both salmon and sardines was unusually small.

Supplies of fishery products were somewhat lower this January-June than last. Stocks of the frozen commodities at the beginning of 1960 were well above those of a year earlier, but canned fishery products were much lower. The catch and imports of food fish and shellfish through midspring also were down. Civilian per capita consumption of these foods was maintained at the year-earlier level by drawing on stocks. Retail prices averaged a little lower than in the first half of 1959 because of the lower prices this past winter.

This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and

published in the former agency's July 29, 1960, release of The National Food Situation (NFS-93).



Michigan

COMMERCIAL FISHING REGULATIONS TO BE LIBERALIZED:

Five liberal changes in Michigan's commercial fishing regulations tentatively approved by the Conservation Commission were due to come up for discussion on July 25, 1960, at public hearings in Escanaba and Lansing.

The changes, slated for formal commission adoption in August 1960, would:

- (1) Allow commercial fishermen under special permit to use gill nets with less than $2\frac{1}{2}$ -inch mesh for taking chubs, herring, alewife, and smelt in those southern Lake Michigan waters where trawling for those so-called "industrial fish" became legal June 12.
- (2) Shorten the closed season on whitefish in Lakes Huron and Michigan by 15 days to begin October 15; lower the legal size on catfish from 17 to 15 inches, except in Lake Erie where it would be dropped from 15 to 14 inches, provided that these fish be sold only at docks on or along the lake.
- (3) Remove the closed season on black crappies (calico bass) in Lake Huron; and match the season on yellow perch in Green Bay with the June 1-April 25 season in Lake Michigan.



North Atlantic Fisheries Exploration and Gear Research

OTTER-TRAWL PERFORMANCE OBSERVED WITH UNDERWATER TELEVISION:

M/V "Delaware" Cruise 60-9: Observations of otter-trawl gear performance utilizing underwater television from the

U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware were conducted June 10-28, 1960. A photographic record was made from the shipboard television monitor showing otterboard action at various speeds.

Operations were conducted in waters near the southern portion of Stellwagen Bank and near the Cape Cod Bay shore off North Truro, Mass. A standard New England No. 41 trawl net was used in all operations.

During the first portion of the cruise, attempts were made to photograph sections of the net utilizing a two-man underwater vehicle towed in front of the net. The underwater television camera unit was pivot-mounted on the stern of the vehicle. Views of the cod end and headrope were recorded on film. Due to low water temperatures, the divers' maximum "vehicle time" could not be safely extended beyond nine minutes. In addition, poor visibility made it desirable to terminate vehicle operations for the remainder of the cruise.

Excellent results were attained by lowering the underwater television camera down the towing warps to a position just ahead of the otterboards. A series of trawl-door scenes were film-recorded from the underwater television monitor on board the Delaware, showing the actions of the trawl doors at different towing speeds. Over 3,000 feet of film were taken during these operations.

Operations were conducted to test procedures for sending the television camera down to the area between the trawl doors. By using a bride attached to each trawl wire, the area forward of the mouth of the net was surveyed by the television camera.

These studies were carried on as a part of a program of research designed to better understand the functioning of the otter-trawl fishing gear.



North Atlantic Fisheries Investigations

INSHORE HADDOCK NURSERY GROUNDS SURVEYED:

M/V "Delaware" Cruise 60-10: The inshore nursery grounds of haddock were surveyed by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware

during a July 5-9 cruise. A scientific crew of five, collected information from 32 inshore stations located in the Ipswich Bay area, off Cape Cod, in the Nauset Beach area, and Stellwagen Bank in Massachusetts Bay.

Haddock were taken in each area, but the area off Race Point, Provincetown, the tip of Cape Cod, was found to have the largest concentration of small haddock. These small fish belonging to the 1958 year-class will, in another year, become an important part of the commercial catch. In addition to haddock, 22 other species of fish were taken in varying quantities. Among these were cod, pollock, hake, and dogfish.



North Pacific Exploratory Fishery Program

GOOD TRAWLABLE BOTTOM FOUND OFF STRAIT OF JUAN DE FUCA:

M/V "John N. Cobb" Cruise 46: Commercial quantities of groundfish were found in four separate areas by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb during an 8-week (ended June 24, 1960) exploratory fishing cruise in the bad bottom "spit area" west of Cape Flattery. The first area (see chart) produced principally petrale sole. Each of two 60-minute tows caught 1,200 pounds of this species at depths from 61 to 79 fathoms. Three additional trawl tows in the deeper water of the same area produced moderate catches of rockfish. The area covers approximately 15 square miles.

The second area produced principally dover sole. Two 70-minute tows produced 4,000 and 3,800 pounds of rockfish at depths from 57 to 72 fathoms. The area measures approximately 10 square miles. A 90-minute tow adjacent to that area in 72-80 fathoms took 1,500 pounds of dover sole.

The third area produced principally snappers (rockfish). Catches ranged from approximately 500 pounds to 4,500 pounds per hour in depths from 70 to 80 fathoms. The area is approximately 10 miles long and 2 to 3 miles wide.

The fourth area located produced excellent catches of Pacific ocean perch. Five tows produced perch at rates from 500 to 4,000

pounds per hour in depths ranging from 75 to 92 fathoms. This was the largest clear area found and measured approximately 10 miles by 6 miles.

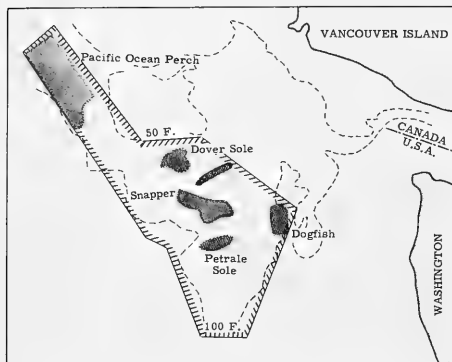


Fig. 1 - M/V John N. Cobb Cruise 46 (May-June 1960).

A fifth area of clear dragging bottom was also discovered; however, tows produced only large catches of dogfish. The area measured approximately $2\frac{1}{2}$ by 4 miles and ranged in depth from 75 to 98 fathoms.

The locations of the trawable areas and catches obtained were communicated to the commercial trawling fleet directly. The commercial otter-trawl fleet was quick to take advantage of the discovery of favorable bottom in an area which had previously been considered too rough for bottom trawls. The commercial fleet landed over 300,000 pounds from the petrale sole and dover sole areas before the completion of the cruise by the Bureau's vessel.

The procedure used to survey the area was as follows: (1) Sounding transects, using a high resolution research model echo-sounder, were made approximately two miles apart and at right angles to each other over an area of approximately 100 square miles. The character of the bottom with respect to hardness was plotted during the sounding transects as were the definitely untrawable stretches. (2) The promising sections within the soft bottom areas were then surveyed using a snag cable 280 feet long between standard 8-foot by 4-foot otter doors. (3) On snag cable tows coming clear a standard 400-mesh eastern otter trawl was towed to evaluate the species and magnitude of fish populations present.

A total of 174 stations, including sounding transects, snag cable tows, and otter trawl tows, was made during the cruise.

Biologists from the Washington State Department of Fisheries tagged and released numbers of petrale sole and ling cod--as part of their research program on the commercial groundfish species.

M/V "John N. Cobb" Cruise 47: The Cobb was scheduled to depart on July 18, 1960, for 7 weeks of exploratory bottom trawling off the north end of Vancouver Island (Quatsino Sound to the Scott Islands). The primary

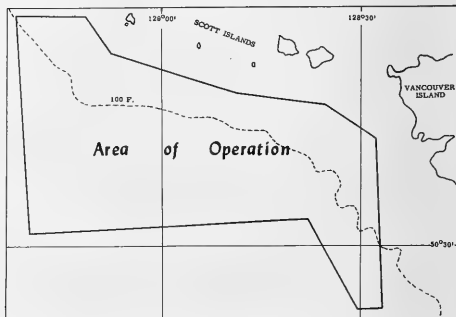


Fig. 2 - M/V John N. Cobb Cruise 47 (July-September 1960).

purpose was to evaluate the commercial potential of bottom fish in that area. Records will be maintained on (1) the general topography of the area and (2) oceanographic and meteorological conditions. For the more important commercial species that are encountered, lengths and average weights will be measured. Otoliths ("ear bones") will be removed from English and petrale sole so that their approximate ages can be determined.

Transects using sonic equipment will be made over runs of approximately constant depth. Transects showing trawable bottom will be surveyed with a standard otter trawl to assess the commercial fishing potential.



Oysters

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING:

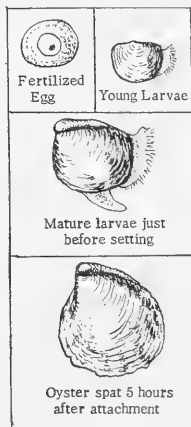
The U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn., will again conduct systematic observations in Long Island Sound on spawning and setting of oysters and starfish, using the same 10 major stations as in previous years. In addition to the basic stations, at least 12 auxiliary ones will be used, principally in the Milford and New Haven areas. These stations, however, are primarily designed for studies dealing with development of mechanical and chemical methods of control of shellfish enemies.

The bottom water temperature recorded at the stations during the week ending July 9 varied from about 60.0° F. at the deepest stations to about 68.0° F. at the shallow ones. Some oysters have spawned but no larvae have been found in the plankton samples collected on July 5, 1960.

Setting of starfish began on July 1 and young stars were observed on the collectors at most of the stations except two. To date, however, the setting has been light with the heaviest amounting to 9 starfish per 20 shells at one station located in 30 feet of water in the Milford area. (Bulletin No. 1, July 11, 1960.)

The bottom water temperature recorded during the collecting trip on July 18 ranged from 66.0° F. at the deepest stations to 71.0° F. at New Haven Stations #4, #5, and #6. The water was extremely rich in phytoplankton; numerous blooms covering areas of several square miles each were observed. However, oyster larvae were virtually absent in plankton samples. These samples consist of material retained from about 200 gallons of sea water by a #20 net.

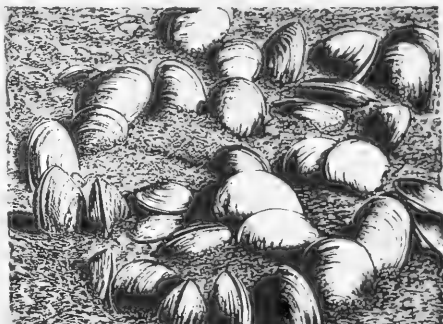
No oyster set has been recorded, but setting of starfish is continuing and during July 14 to July 18 it showed a great increase in intensity, especially at Station #3, which is the deep-water station at Milford, and Station #7, a



deep-water station in the New Haven area. (Bulletin No. 2, July 20, 1960.)

NEW METHOD OF CONTROL FOR COMMON MUSSEL:

A new method for control of the common mussel, a competitor of oysters, has been developed by the U. S. Bureau of Commercial Fisheries, Milford Biological Laboratory. In



The characteristic position of sea mussel. The anterior end buried in the sand and the posterior or syphon end projecting well above the level of the bottom.

preliminary experiments, a 1-percent solution of copper sulfate killed 99.3 percent of the mussels, while an insignificant number of oysters was injured. Further experiments are now in progress, but all observations to date show the same results, i.e. nearly all mussels are killed by the treatment, while few oysters are injured. Several oyster companies, which have beds that are now heavily populated with mussels, plan to use the method this summer. The copper sulphate method is much cheaper and more effective than Victoria Blue. The latter, however, is still very useful in combating other competitors, such as tunicates.



Scallops

AUGUST SCALLOP FESTIVAL AND PUBLICITY CAMPAIGN:

Commercial fishing and allied food trade industries cooperated in the publicity for the "New Bedford Scallop Festival" in August 1960. Because of the large stocks and low prices, the U. S. Bureau of Commercial Fisheries cooperated with the New England scallop industry in its effort to move scallops



SCALLOP FESTIVAL

New Bedford, Mass. 1960

into trade channels. At the request of the Bureau, the U. S. Department of Agriculture listed scallops on the List of Foods in Plentiful Supply for August and publicized scallops in the material it distributes to the food trade and food service industries.

To help the scallop industry market its product, the Bureau's other efforts included:

Press Release and Special Marketing Bulletin consisting of story and three scallop recipes, for distribution to the Bureau's mailing list of some 2,300 food editors, nutritionists, dietitians, and others in the food and allied industries.

For use by restaurants, 25,000 Fisheries Marketing Bulletins featuring scallop recipes for 25, 50, and 100 portions for distribution to the major regional, state, and local restaurant associations in the United States, and by the Bureau's field staff.

For use by institutions, 33,000 Fisheries Marketing Bulletins prepared in cooperation with Sun-Kist, featuring scallops and lemons for distribution through the Sun-Kist nationwide mailing list, and by the Bureau's field staff.

For food editors, nutritionists, dietitians, and others in the food and allied industries, 7,000 fisheries marketing bulletins prepared in cooperation with Sun-Kist featuring lemons and scallops for distribution through the Sun-Kist nationwide mailing list and the Bureau's field staff.

In an effort to enlist the support of the important allied food trade industries, a telegram, signed by Ross Leffler, Assistant Secretary for Fish and Wildlife, Department of the Interior, was sent to over 40 trade organizations.

To carry this promotion into the fall selling months a special flyer for School Lunch

and the institutional trade was prepared for use during Fish 'n Seafood Parade in October. In addition scallops are featured in a Special Fishery Marketing Bulletin for food editors, nutritionists, dietitians, and others in the food and allied industries.

Supplementing the printed material, the Bureau's Home Economists featured scallops in their demonstrations before school-lunch personnel, dietitians, restaurant operators, chefs, extension agents and others.

Marine Park overlooking beautiful Buzard's Bay in New Bedford, was the scene of the 3rd Annual Scallop Festival, August 12, 13, and 14, 1960. Based on the popularity of last year's Festival, approximately 20,000 people from all parts of the country were present to sample this seafood.

* * * * *

SHUCKING METHOD DEVELOPED:

Before the calico scallop beds discovered off the Florida coast by the U. S. Bureau of Commercial Fisheries' chartered fishing vessel Silver Bay could be exploited, an economical means of shucking the small scallops needed to be developed. The Bureau's Technology Laboratory at Pascagoula, Miss., has come up with a simple shucking method which may adequately cover this need. The scallops are placed in warm water, which relaxes the shellfish, and then the shell is split. The viscera are pulled out by a vacuum pump, leaving the "eye muscle" to be cut by the workers. It appears that this method is fast and economical.

Note: Also see Commercial Fisheries Review, Mar. 1960 p. 26.



Shrimp

ALASKA CANNED PRODUCT YIELD INCREASED:

How to increase the product yield in Alaska canned shrimp was revealed by recent studies at the Ketchikan, Alaska, Bureau of Commercial Fisheries Technological Laboratory. Hitherto automatic removal of the shells of Alaska shrimp required that the shrimp be held in ice or in refrigerated sea water for two days to facilitate release of the shrimp meats from the shells. Studies on the holding process indicated that the product yield decreased by 13 percent during the

two-day holding period and that a further 2-percent loss in yield occurred for each additional day of holding beyond the two-day minimum.

Preliminary processing studies have indicated that briefly immersing the shrimp immediately after receipt in a very weak acidic solution may permit automatic shell removal without the customary waiting period.

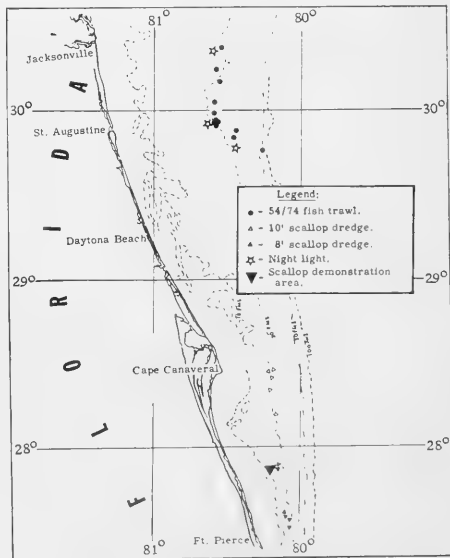
Successful completion of these studies will markedly improve product yield in Alaska canned shrimp and probably also improve the product quality.



South Atlantic Exploratory Fishery Program

COMMERCIAL SCALLOP DREDGE DEMONSTRATED TO FISHERMEN:

M/V "Silver Bay" Cruise 24: During May 26 to June 14, the U. S. Bureau of Commercial Fisheries' chartered fishing vessel Silver Bay returned to the Florida east coast



M/V Silver Bay Cruise 24 (May 26 - June 14, 1960).

for follow-up operations in the recently-discovered calico exploratory trawling for red snapper.

Because of extensive interest shown by the industry, daily trips were scheduled out of Fort Pierce for the purpose of demonstrating scallop fishing gear and methods and to provide samples for processing tests. From May 30 to June 5, 86 observers participated in the fishing demonstrations, which were conducted in a limited buoyed area (27°53' N.-80°09' W.), approximately 9 miles north of Bethel Shoals buoy. At this location, 25 drags with a single 8-foot modified New England-type scallop dredge produced 285 bushels of live scallops in 11.8 hours of fishing.

Limited exploration for red snapper (*Lutjanus aya*) with a 54' / 74' roller-rigged, 2 seam, 4½" mesh nylon fish trawl, between Daytona and Jacksonville, resulted in the location of suitable trawling bottom and small catches of red snapper.

Catches of mixed fish, up to 1,595 pounds per 90-minute tow, consisted predominantly of triggerfish (*Balistes*), grunts (*Bathystoma*), angelfish (*Angelichthys*), porgies (*Pagrus* and *Stenotomus*), and vermilion snappers (*Rhomboplites*). Food fish captured included 63 pounds of red snappers, 82 pounds of lane snappers (*L. synagris*), large (11"-14") vermilion snappers, dog snappers (*L. jocu*), hogfish (*Lachnolaimus maximus*), and 334 pounds of porgies.

Approximately 60 large surface schools of fish, tentatively identified as thread herring (*Opisthonyma*), scad (*Decapterus*), and menhaden (*Brevoortia*), were observed in the vicinity of Bethel Shoal (27°44' N.-80°10' W.) on May 30. Numerous little tuna (*Euthynnus alletteratus*), dolphin (*Coryphaena*), and king mackerel (*Scomberomorus cavalla*) were taken on trolling gear in this area.

Note: Also see *Commercial Fisheries Review*, July 1960, p. 41.



Standards

MEETINGS HELD ON PROPOSED QUALITY STANDARDS FOR FROZEN OCEAN PERCH FILLETS:

The U. S. Bureau of Commercial Fisheries announced on July 13, 1960, public meetings to discuss standards for frozen ocean perch and Pacific ocean perch filets.

Developed by the Bureau at its new Gloucester, Mass., Technological Laboratory and the Seattle, Wash., Laboratory, this standard is another step in a continuing joint effort by Government and industry to improve the quality of fishery products. Similar quality standards are already in use for eight other frozen sea foods--fish sticks, fish blocks, salmon and halibut steaks, cod and haddock filets, raw breaded fish portions, and shrimp.

The meetings were held in Gloucester, Chicago, and Seattle.



United States Fishing Fleet^{1/} Additions

APRIL 1960:

A total of 24 vessels of 5 net tons and over were issued first documents as fishing craft during April 1960--a decrease of 21 vessels as compared with the same month in 1959. The Pacific area continued to lead with 14

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, April 1960

Area	April		Jan.-April		Total
	1960	1959	1960	1959	
New England	2	1	5	6	15
Middle Atlantic	-	-	5	3	12
Chesapeake	4	9	13	30	106
South Atlantic	1	5	15	23	76
Gulf	3	15	16	40	135
Pacific	14	13	32	21	97
Great Lakes	-	-	3	3	6
Alaska	-	-	1	4	32
Total	24	45	90	130	479

Note: Vessels assigned to the various areas on the basis of their home ports.

vessels. The remaining 10 vessels were issued first documents in the Chesapeake, Gulf, New England, and South Atlantic areas.

During the first four months of 1960, a total of 90 vessels were issued first documents as fishing craft--40 below the same period of 1959. Most of the decline occurred in the Gulf area with a drop of 24 vessels as compared with the 1959 four-month period.

* * * * *

MAY 1960:

A total of 63 vessels, of 5 net tons and over, were issued first documents as fishing ^{1/}Includes both commercial and sport fishing craft.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, April 1960

Net Tons	Number
5 to 9	15
10 to 19	7
40 to 49	1
310 to 319	1
Total	24

craft during May 1960--18 above May 1959. The Alaska area represented the greatest

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, May 1960

Area	May		Jan.-May		Total 1959
	1960	1959	1960	1959	
	(Number)				
New England	1	1	6	7	15
Middle Atlantic	3	-	8	3	12
Chesapeake	10	4	23	34	106
South Atlantic	5	8	20	31	76
Gulf	11	11	27	51	135
Pacific	19	18	51	39	97
Great Lakes	1	-	4	3	6
Alaska	13	3	14	7	32
Total	63	45	153	175	479

Note: Vessels assigned to the various areas on the basis of their home ports.

increase with a gain of 10 vessels as compared with the same month of 1959, followed by the Chesapeake area with a gain of 6 vessels.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, May 1960

Net Tons	Number
5 to 9	38
10 to 19	10
20 to 29	7
30 to 39	1
140 to 149	1
150 to 159	2
320 to 359	4
Total	63

During the first five months of 1960, a total of 153 vessels were issued first documents as fishing craft--a drop of 22, compared with the 1959 five-month period. The Pacific area with 51 vessels made up one-third of the total vessels documented--12 above the same period of 1959.



United States Fishery Landings, January-June 1960

Landings of fish and shellfish in the United States during the first half of 1960 dropped 11 percent as compared with the same period of 1959--from 1.6 billion pounds in 1959 to 1.4 billion pounds in 1960.

The greatest decline was for menhaden--156 million pounds less in 1960 than in the first half of 1959. Menhaden landings on the Atlantic Coast dropped sharply and only a slight increase was reported in the Gulf States. During January-June 1960, herring landings in Alaska were down about 18 million pounds and industrial fish landings in Maine and Massachusetts were down about 30 million pounds as compared with the first half of 1959.

On the Pacific Coast, landings of salmon in Alaska for the first seven months this

Table 1 - United States Fishery Landings of Certain Species for Periods Shown, 1960 and 1959^{1/}

Species	Period	1960	1959	Total 1959
		. . . . . (1,000 lbs.)		
Anchovies, Calif.	6 mos.	1,000	1,800	7,173
Cod:				
Maine	4 mos.	1,000	833	2,934
Boston	6 "	8,400	9,171	17,709
Gloucester	6 "	1,800	1,607	3,233
Total cod		11,200	11,611	23,476
Haddock:				
Maine	4 mos.	1,200	1,272	3,405
Boston	6 "	38,700	40,480	72,378
Gloucester	6 "	8,800	9,404	12,103
Total haddock		48,700	51,156	87,886
Halibut 2/:				
Alaska	6 mos.	14,300	13,640	17,908
Wash. and Oreg.	6 "	10,700	11,424	22,537
Total halibut		24,900	25,064	40,445
Herring, Alaska	6 mos.	23,500	41,000	107,444
Industrial fish, Me. & Mass. 3/	6 "	14,700	44,525	103,312
Mackerel:				
Jack	6 mos.	38,000	15,322	37,484
Pacific	6 "	9,200	6,136	37,597
Menhaden	6 "	531,200	687,100	2,193,866
Ocean perch:				
Maine	4 mos.	17,100	19,656	75,225
Boston	6 "	400	1,756	3,220
Gloucester	6 "	32,000	25,814	53,197
Total ocean perch		49,500	47,226	136,702
Salmon:				
Alaska	7 mos.	100,000	105,000	147,278
Washington	4 "	200	391	41,800
Oregon	5 "	800	999	5,927
Scallops, sea (meats), New Bedford	6 "	8,900	8,100	18,814
Shrimp (heads-on):				
South Atlantic & Gulf States	6 mos.	61,800	59,600	226,074
Wash.	4 "	300	400	2,992
Oregon	5 "	100	1,505	2,781
Squid, Calif.	6 "	300	14,918	19,753
Tuna, Calif.	to July 23	168,100	165,300	254,775
Whiting:				
Maine	4 mos.	400	-	23,330
Boston	6 "	57	72	687
Gloucester	6 "	14,200	13,318	11,737
Total whiting		14,657	13,390	85,823
Total all above items		1,167,657	1,305,003	3,574,562
Others (not listed)		271,443	303,092	1,525,438
Grand total		1,439,100	1,608,095	5,100,000

^{1/}Preliminary. ^{2/}Dressed weight. ^{3/}Excluding menhaden.

year were 55 million pounds greater than in the same period of 1959. Jack mackerel

Table 2 - United States Fishery Landings by States for Periods Shown, 1960 and 1959 ^{1/}

Area	Period	1960	1959	Total 1959
.....(1,000 lbs.).....				
Maine	4 mos.	26,000	23,024	265,959
Massachusetts ^{2/} :				
Boston	6 mos.	55,500	60,088	113,257
Gloucester	6 "	68,200	76,741	228,723
New Bedford	6 "	40,700	56,228	107,961
Provincetown	6 "	9,400	8,603	27,700
Total Mass.		173,800	201,660	477,641
Rhode Island ^{3/} :	5 mos.	14,100	45,800	100,591
New York ^{3/} :	6 "	23,000	20,300	38,656
New Jersey ^{3/} :	6 "	34,300	28,777	56,929
Maryland ^{3/} :	6 "	23,100	27,413	60,500
North Carolina ^{3/} :	6 "	27,900	32,026	62,794
South Carolina ^{3/} :	6 "	5,600	4,200	18,654
Georgia	6 "	8,900	7,001	21,513
Florida ^{3/} :	5 "	62,100	59,365	142,860
Alabama	4 "	2,400	2,512	14,022
Mississippi ^{3/} :	4 "	3,300	2,500	80,944
Louisiana ^{3/} :	1 "	5,000	3,039	99,963
Texas ^{3/} :	5 "	13,300	10,731	82,715
Ohio	6 "	9,900	11,132	18,586
Alaska:				
Halibut ^{4/} :	6 "	14,300	13,640	17,908
Herring	6 "	23,500	41,000	107,444
Salmon	7 "	160,000	105,000	147,278
Washington ^{2/} :	4 "	20,000	30,234	187,920
Oregon ^{2/} :	5 "	16,200	14,822	52,377
California:				
Certain species ^{5/} :	6 mos.	217,200	203,476	356,682
Other	4 "	26,100	29,496	155,519
Total Calif.		243,300	232,972	512,201
Hawaii	3 mos.	1,600	1,647	16,570
Rhode Island, Middle Atlantic, Chesapeake, South Atlantic, and Gulf States (menhaden only)	6 mos.	527,200	684,900	2,158,423
Total all above		1,439,100	1,608,695	4,712,378
Others not listed		6/	6/	387,622
Grand total		6/	6/	5,100,000

^{1/} Preliminary.

^{2/} Landed weight.

^{3/} Excludes menhaden.

^{4/} Dressed weight.

^{5/} Includes catch of anchovies, jack and Pacific mackerel, squid, and tuna. Data on tuna are through July 23.

^{6/} Data not available.

Note: Data principally represent weight of fish and shellfish as landed except for mollusks which represent the weight of meats only.

landings during the first half of 1960 were up 23 million pounds and Pacific mackerel 3 million pounds.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, MAY 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during May 1960 increased by 8.8 percent in quantity and 14.6 percent in value as compared with April 1960. The increase was due primarily to higher imports of frozen tuna other than albacore (up 6.6 million pounds) and to an increase of about 2.2 million pounds each in the imports of shrimp, lobster and spiny lobster, and fillets other than groundfish. The increase was partly offset by a 4.3-million pound decrease in the imports of groundfish fillets.

United States Imports and Exports of Edible Fishery Products, May 1960 with Comparisons					
Item	QUANTITY		VALUE		
	May 1960	Year 1959	May 1960	Year 1959	1959
	. (Million of Lbs.) .		. (Millions of \$) .		
Imports:					
Fish & Shellfish:					
Fresh, frozen, & processed ^{1/}	81.7	82.5	1,070.5	25.9	25.8
Exports:					
Fish & Shellfish:					
Processed only ^{2/} (excluding fresh & frozen)	1.8	5.2	68.0	0.6	1.2
^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.					

Compared with May 1959, the imports in May this year were lower by 1.0 percent in quantity and 0.4 percent in value due mainly to lower imports of groundfish fillets (down 6.2 million pounds). Compensating, in part, for the decreases was an increase of about 5.2 million pounds in the imports of frozen albacore and other tuna.

United States exports of processed fish and shellfish in May 1960 were lower by 49.0 percent in quantity and 53.8 percent in value as compared with April 1960. Compared with the same month in 1959, the exports this May were lower by 65.7 percent in quantity and 50.0 percent in value. The lower exports in May this year as compared with the same month in 1959 were due mainly to sharply lower exports of canned California sardines and squid.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the 12½-percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-July 2, 1960, amounted to 22,698,066 pounds, according to data compiled by the Bureau of Customs. From January 1-July 4, 1959, a total of 21,992,914 pounds had been imported.



U. S. Production of Fish Sticks and Portions, April-June 1960

United States production of fish sticks in the second quarter of 1960 was 12.8 million

Month	(1,000 Lbs.)		
	Cooked	Raw	Total
April	4,474	373	4,847
May	3,366	278	3,644
June	3,983	278	4,266
Total 2nd quarter 1960	11,828	929	12,757
Total 2nd quarter 1959	12,710	971	13,681
Total first 6 months 1960	30,425	2,186	32,611
Total first 6 months 1959	29,343	2,537	31,880

^{1/} Preliminary.

pounds and fish portions 10.4 million pounds. This was a drop of 7 percent in fish sticks but a gain of 21 percent in portions as compared with the same quarter of 1959. Most of the decline in fish sticks occurred in the cooked sticks (down almost 1.0 million pounds). The increase in portions was attributed to a greater production of raw

Area	1960 ^{1/}		1959 ^{2/}	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	22	10,288	22	11,797
Inland and Gulf States	4	1,350	5	994
Pacific Coast States	7	1,119	9	890
Total	33	12,757	36	13,681

^{1/} Preliminary.
^{2/} Revised.

breaded portions (up 1.5 million pounds), while the unbreaded portions dropped to slightly over one-half the amount produced during the same period of last year. Cooked

breaded portions production was up 600,000 pounds.

Month	1960 ^{1/}	1959 ^{2/}	1958 ^{2/}	1957	1956
January	5,496	6,265	5,471	4,261	4,862
February	6,528	6,340	5,925	5,246	5,323
March	7,830	5,394	5,526	5,147	6,082
April	4,847	4,708	4,855	4,492	3,771
May	3,644	4,398	4,229	3,380	3,873
June	4,266	4,575	4,702	3,522	3,580
July		3,783	4,574	3,821	3,153
August		3,872	4,358	4,643	4,166
September		5,343	5,328	4,861	4,085
October		5,831	5,485	5,162	5,063
November		4,822	5,091	4,579	4,585
December		4,734	5,467	4,014	4,019
Total		60,265	61,011	53,128	52,562

^{1/} Preliminary.
^{2/} Revised.

Cooked fish sticks (11.8 million pounds) made up 93 percent of the fish stick total. The remaining 7 percent consisted of raw fish sticks. A total of 10.0 million pounds of

Month	Breaded			Unbreaded	Total
	Cooked	Raw	Total		
April	697	2,506	3,203	167	3,370
May	519	2,509	3,028	100	3,128
June	335	3,412	3,747	149	3,896
Total 2nd quarter 1960	1,551	8,427	9,978	416	10,394
Total 2nd quarter 1959	950	6,911	7,861	704	8,565
Total first 6 months 1960	3,440	17,842	21,282	808	22,090
Total first 6 months 1959	2,627	13,514	16,141	1,366	17,507

^{1/} Preliminary.

breaded fish portions (of which 8.4 million pounds were raw) and 416,000 pounds of unbreaded portions was processed during the second quarter of 1960.

Area	1960 ^{1/}		1959 ^{2/}	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	20	5,042	21	4,071
Inland and Gulf States	6	5,011	8	4,192
Pacific Coast States	6	341	4	302
Total	32	10,394	33	8,565

^{1/} Preliminary.
^{2/} Revised.

The Atlantic Coast was the principal area for the production of fish sticks and portions—15.3 million pounds. The remaining 7.9 million pounds of fish sticks and portions were packed in the inland, Gulf, and Pacific Coast states.

During the first six months of 1960, a total of 32.6 million pounds of fish sticks was pro-

Table 6 - U. S. Production of Fish Portions by Months, 1958-1960

Month	1960 ^{1/}		1959 ^{2/}		1958
	('000 Lbs.)				
January	3,623	2,692	1,973		
February	3,454	3,025	1,254		
March	4,619	3,225	1,471		
April	3,370	2,634	2,268		
May	3,128	2,684	1,478		
June	3,896	3,247	1,504		
July		2,257	2,161		
August		2,796	1,516		
September		3,558	1,566		
October		4,314	2,560		
November		3,483	1,979		
December		3,262	2,060		
Total		37,147	21,790		

^{1/}Preliminary.

^{2/}Revised.

duced--an increase of 2 percent as compared with the corresponding period of 1959; fish portions (22.1 million pounds) production was up 26 percent.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-MAY 1960:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.1 million pounds (value \$1.1 million) of fresh and frozen fishery products were purchased in May 1960 by the Military Subsistence Supply Agency. This exceeded the quantity purchased in April by 29.3 percent and was 6.6 percent over the amount purchased in May 1959. The value of the purchases in May 1960 was up 15.1 percent as compared with April and 6.6 percent more than for May 1959.

During the first five months of 1960 purchases totaled 9.0 million pounds (valued at \$4.8 million)--an increase of 1.2 percent in quantity and 0.5 percent in value as compared with the same period in 1959.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, May 1960 with Comparisons

Quantity				Value			
May		Jan.-May		May		Jan.-May	
1960	1959	1960	1959	1960	1959	1960	1959
('000 Lbs.)							
2,128	1,997	9,022	9,134	1,103	1,035	4,791	4,817
(\$1,000)							

Prices paid for fresh and frozen fishery products by the Department of Defense in May 1960 averaged 51.8 cents a pound, about 6.4 cents less than the 58.2 cents paid in

April but exactly the same as paid in May last year.

Canned Fishery Products: Very small amounts of canned fishery products were

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, May 1960 with Comparisons

Product	Quantity				Value			
	May		Jan.-May		May		Jan.-May	
	1960	1959	1960	1959	1960	1959	1960	1959
Tuna	1	424	1,283	1,832	1/	210	581	868
Salmon	-	7	-	7	-	5	-	5
Sardines	1	229	62	509	1/	26	26	72

1/ Less than \$1,000.

purchased for the use of the Armed Forces during May this year. In the first five months of 1960, purchases of canned tuna, salmon, and sardines were substantially lower than in the same period in 1959.



Wholesale Prices, July 1960

The wholesale price index for edible fishery products (fresh, frozen, and canned) for July 1960 at 129.9 percent of the 1947-49 average was up 2.7 percent from the preceding month. The increase was the result of higher ex-essel prices for haddock at Boston and higher wholesale prices for fresh and frozen haddock filets, Pacific Coast salmon, and western halibut. Compared with July 1959, the fishery products wholesale price index this July was up 5.6 percent principally because of higher prices for fresh and frozen shrimp, fresh salmon, fresh haddock filets, and canned fish.

The index for the drawn, dressed, and whole finfish subgroup this July was sharply higher (10.3 percent) as compared with the preceding month and also higher by 3.1 percent from July a year ago. Responsible for the increase from June to July were higher prices for large-drawn haddock (up 54.9 percent), fresh Pacific salmon (up 4.6 percent), fresh Pacific halibut (up 2.4 percent), Lake Superior drawn whitefish (up 10.5 percent), and yellow pike (up 1.5 percent). A drop of 18.2 percent in the price of Great Lakes round whitefish offset the increases to some extent. The July 1960 subgroup prices were higher than in the same month of 1959 because of the sharp increase in Pacific salmon prices (up 15.6 percent) and smaller increases for fresh halibut and Lake Superior whitefish, offset somewhat by lower wholesale prices for large haddock at Boston and Great Lakes round whitefish and yellow pike at New York.

The fresh processed fish and shellfish subgroup index this July increased slightly (0.6 percent) from the preceding month. A 23.0-percent increase in the wholesale price for fresh small haddock filets was almost completely offset by a 3.1-percent decline for fresh shrimp at New York City. Shrimp prices seasonally drop in the summer and fall months. The July 1960 subgroup wholesale price index was higher by about 18.7 percent from July a year ago due to sharply higher prices for all the subgroup items.

This July the wholesale price index for the frozen processed fish and shellfish subgroup declined slightly (0.5 percent) from a month earlier. An increase of about 2 cents a pound in the frozen haddock fillet price from the fractionally low level of the past few months failed to offset fractionally lower prices for frozen ocean perch and flounder filets and shrimp. From July a year ago to this July, the subgroup

price index was down 2.6 percent due primarily to lower prices for frozen haddock fillets (down 19.4 percent) and other fillets. The decreases were partially offset by a 2.6-percent increase in frozen shrimp prices at Chicago.

There was no movement in the canned fish primary price index, but it still was up 4.3 percent from July 1959. All canned fish items were higher this July as compared with the same month of 1959. In July 1959 the fish canneries were active packing salmon, mackerel, Maine sardines, and Cali-

fornia tuna. Although the reported July prices for canned tuna at the packers' level were about unchanged from recent months, heavy stocks of both domestic and imported canned tuna resulted in reductions in the form of promotional or advertising and other allowances. The excellent July pack of Bristol Bay canned sockeye or red salmon was offset by a poor pack of the less expensive pink salmon and other types of salmon in other areas. After a poor start in June, the Maine sardine canned pack picked up and at the end of July was at about the same level as for the same period a year ago.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, July 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/}		Indexes (1947-49=100)					
			(\$)		July 1960	June 1960	July 1960	June 1960	May 1960	July 1959
			July 1960	June 1960	July 1960	June 1960	May 1960	July 1959		
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					129.9	126.5	126.6	123.0		
Fresh & Frozen Fishery Products:					147.7	142.0	142.2	139.0		
Drawn, Dressed, or Whole Finfish:					165.1	149.7	150.1	160.2		
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.09	136.8	88.3	94.1	104.5		
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.34	.34	105.2	103.7	93.5	103.6		
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.88	.84	198.0	189.3	184.8	171.3		
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.83	.57	156.2	141.3	183.4	151.2		
Whitefish, L. Erie pound or gill net, rnd., fres.	New York	lb.	.68	.83	136.6	166.3	212.5	159.8		
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.68	.67	158.3	155.9	170.0	190.0		
Processed, Fresh (Fish & Shellfish):					146.0	144.8	145.8	123.0		
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.46	.37	154.8	125.9	91.9	139.5		
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.79	.82	124.8	128.8	135.1	104.3		
Oysters, shucked, standards	Norfolk	gal	7.00	6.88	173.2	170.7	170.1	145.4		
Processed, Frozen (Fish & Shellfish):					117.8	118.4	117.7	120.9		
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	102.1	98.1	102.1		
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.27	.25	84.8	78.5	80.1	105.2		
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.27	.28	106.7	110.8	112.8	112.8		
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.79	.80	121.5	123.8	123.5	118.4		
Canned Fishery Products:					104.8	104.8	104.8	100.5		
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	24.50	127.8	127.8	127.3	122.6		
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.10	11.10	80.0	80.0	80.0	77.9		
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	8.00	8.00	93.9	93.9	93.9	85.1		
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	87.8		

^{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.



PROCESSING WHALE LIVERS TO PREVENT LOSS OF VITAMIN A

In a whale factoryship fitted out in East Germany on Russian account, special equipment for the treatment of whale livers was included. The liver oils are recovered by a special solvent extraction process in order to prevent loss of vitamin A. The livers are reduced in mincers and produced in the form of flakes in a coagulating chamber. They are then dried under vacuum to reduce the moisture content. The dried livers are extracted by a batch process with trichlorethylene which is recovered from the oils by distillation. The solvent-free oil is stored in drums for further processing. The residue is dried into a meal (World Fishing, November 1956).



FOREIGN

International

EASTERN GULF OF MEXICO SHRIMP
CONSERVATION COMMISSION

FIRST MEETING HELD IN CUBA:

The United States-Cuba Commission for the Conservation of Shrimp in the Eastern Gulf of Mexico held its first meeting at Havana, Cuba, from June 30 to July 1, 1960. Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, was elected chairman and Dra. Isabel Perez Farfante of Cuba was elected vice chairman.

The Commission agreed upon a coordinated research program that would meet its obligation under the Convention to maintain the maximum sustainable productivity of stocks of shrimp of common concern to Cuba and the United States in waters of the Gulf of Mexico off the coast of Cuba and the Florida coast of the United States. The scientific program is designed to provide information required for:

1. Identification of the stocks of common concern and the area they occupy.
2. Determination of the necessity for any conservation measures to assure the maximum sustainable yield, taking into account particularly the growth and death rates of shrimp in the area, the effect of the fishery on the stock, and the type of measure which would be most effective.
3. Determination of the effect of environment on the stocks.

It is expected that the program of the Commission will be inaugurated in the near future.

The next annual meeting of the Commission will be held in April 1961 at a place to be later determined.

Note: Also see Commercial Fisheries Review, May 1960, p. 45.

EUROPEAN ECONOMIC COMMUNITY

TARIFFS ON FISHERY PRODUCTS ANNOUNCED:

The European Economic Community (Common Market) recently announced its Common Customs Tariff. This common

external tariff schedule is to supplant the individual national import tariffs of the six member-countries (the Netherlands, Belgium, Luxembourg, West Germany, France, and Italy). The tariff treatment proposed for fishery products is of particular concern because of the effect the changes in import treatment may have upon international trade in fish and fish products.

The duty rates proposed to be applied to imports of fishery products into the Common Market area are shown in the table. Duties on most fresh, frozen, or cured fish and shellfish will range between 10 and 20 percent ad valorem. Duties on most canned fish and shellfish range from 20 to 30 percent. Few items are less than 10 percent, or duty free. In addition to the common external tariff, special provisions for import control--the details of which are yet undetermined--will apply to fishery products.

Under the Treaty of Rome of March 27, 1957, the six Common Market countries agreed to establish a complete economic union. The treaty provides, among other things, for the gradual elimination of all tariffs and quotas on trade among the six countries and for the establishment of a single common import tariff on products from outside the area. This will impose common commercial policies; trade treaties with other countries will be negotiated by the Community as a unit.

Within the Common Market, customs duties and quantitative import restrictions on fishery products are to be gradually reduced and finally abolished over a period of not more than 12 years. The first reduction of duties was made on January 1, 1959, amounting to 10 percent of the national tariff rates in force on January 1, 1957. Any reductions in customs duties that were above the common tariff were extended to other countries. A second cut, of 20 percent, was made on July 1, 1960. Also, bilateral import quotas are to be opened to all members and increased by 20 percent each year.

During the transitional period, any member country may, on certain conditions, apply minimum prices below which imports are to be temporarily suspended or reduced. A council of Ministers will determine objective criteria for the establishment of minimum price systems. Other special provisions allow for establishment of long-term contracts and for use of compensatory levies on imports.

By the end of the transitional period, a common fishery policy will be established. The general rules of competition provided for by the Rome Treaty are not automatically applicable to fisheries. Special rules may be determined by the Council. To achieve aims of a common policy, the Community may adopt a basis for organization of fish marketing, set rules of competition, and coordinate national market organizations in their effort to unify markets, prices, and support policies. The outcome will depend upon the policies followed by the Council in working out the details. Arrangements for implementing these provisions have not yet been worked out by the Council.

The common external tariff was generally derived from a simple arithmetic average of national duty rates but the customs duties for most fish products were negotiated by special agreement among the six countries. For example, the proposed common external duty for canned sardines is 25 percent ad valorem. Present rates in effect are 15 percent in the Benelux countries (Belgium, the Netherlands, and Lux-

International (Contd.):

embourg), 31.5 percent in France, 14 percent in West Germany, and 27 percent in Italy. Rates in effect for fresh and frozen fillets of sea fish are free in Benelux countries, 35 percent in France, 5 percent in West Germany, and 20 percent in Italy. The proposed external tariff is 18 percent. During the transition period, the rates of duty for the Benelux and West Germany must be raised, and those for France and Italy reduced.

Many of the present duties of the member countries are subject to concessions made in previous trade agreement negotiations. Changes in these duties to the common external tariff will require renegotiation of concessions. Beginning in early September 1960, the United States and other members of the General Agreement on Tariff and Trade (GATT) will meet in Geneva to confer with the Common Market, under provisions of Article XXIV, paragraph 6. This section, although noting that weight should be given to decreases in duties which may be made in arriving at a common external tariff, provides for the granting of compensatory tariff concessions by the customs union to offset increases in rates previously negotiated by its members. Furthermore, it is still undetermined which, if any, of the duty rates in the common external tariff will be considered "bound." Such items would require compensation to other countries if the Common Market should decide to raise the duties.

Exceptions to the common external tariff have been requested by several member countries. Italy has requested duty-free quotas for fresh or frozen tuna and for stockfish and klipfish. Several, including West Germany, have asked for duty-free quotas on herring and fresh and frozen fish (except fillets). The extent of these exceptions to the common tariff is not yet known.

In January 1961, the members of GATT, including the Common Market, will negotiate new tariff concessions. These negotiations may result in further reductions in the external tariff of the Common Market.

Duties for Selected Fishery Products in Common Customs Tariff of the European Economic Community		
Tariff Heading Nos.	Description of Goods	Ad valorem Duty Rates
02.04C	Other meat and edible meat offals, fresh, chilled or frozen (marine mammals)	19%
02.06C	Other meat and edible meat offals, salted, dried, or smoked (marine mammals)	24%
03.01	Fish, fresh, chilled, or frozen:	
	A. Fresh-water:	
	I. Trout and other salmonidae	16%
	II. Other	10%
	B. Salt-water:	
	I. Whole, headless or in pieces:	
	a. Herrings, sprats and mackerel:	
	1. From Feb. 15 to June 15	Free
	2. From June 16 to Feb. 14	20%
	b. Tunny and sardines	25%
	c. Other	15%
	II. Fillets	18%
	C. Livers and roes	14%
03.02	Fish, salted, in brine, dried or smoked:	
	A. Salted, in brine or dried:	
	I. Whole, headless or in pieces:	
	a. Herrings and pilchards	12%
	b. Cod, including stockfish and klipfish	13%
	c. Sardines and other	15%
	II. Fillets:	
	a. Of cod, including stockfish and klipfish	20%
	b. Other	18%

Tariff Heading Nos.	Description of Goods	Ad valorem Duty Rates
03.02 (Contd.)	B. Smoked	16%
	C. Liver, roes; fish meal	15%
03.03	Crustaceans and molluscs, whether in shell or not, fresh (live or dead), chilled, frozen, salted, in brine or dried; crustaceans, in shell, simply boiled in water:	
	A. Crustaceans:	
	I. Spiny lobsters and lobsters	25%
	II. Crabs, shrimps and crayfish	18%
	III. Other (Norway lobsters, etc.)	14%
	B. Molluscs:	
	I. Oysters:	
	a. European or flat oysters (<i>Ostrea edulis</i>), weighing not more than 40 grams each	Free
	b. Other	18%
	II. Mussels	10%
	III. Other	8%
05.05	Fish waste	Free
05.11	Tortoise-shell (shells and scales), unworke or simply prepared but not cut to shape; claws and waste of tortoise-shell	Free
05.12	Coral and similar substances, unworke or simply prepared but not otherwise worked; shells, unworke or simply prepared but not cut to shape; powder and waste of shells	Free
05.13	Natural sponges:	
	A. Raw	Free
	B. Other	8%
05.14	Ambergris, castoreum, civet and musk; cantharides; bile, whether or not dried; animal products, fresh, chilled or frozen, or otherwise provisionally preserved, of a kind used in the preparation of pharmaceutical products	Free
05.15	Animal products not elsewhere specified or included; dead animals of Chapter 1 or Chapter 3, unfit for human consumption:	
	A. Fish of a length of 6 cm. or less and shrimps, dried	5%
	B. Other	Free
13.03	C. I. Agar-agar	4%
	III. Other (thickeners extracted from vegetable materials)	Free
15.04	Fats and oils, of fish and marine mammals, whether or not refined:	
	A. Fish liver oils:	
	I. Of halibut	Free
	II. Other	8%
	B. Fish fats and oils, other than fish liver oils	Free
	C. Marine mammal fats and oils:	
	I. Whale oil	2%
	II. Other	Free
15.08	Animal and vegetable oils, boiled, oxidized, dehydrated, sulphurized, blown or polymerized by heat in vacuum or in inert gas, or otherwise modified	15%
15.10	Fatty acids; acid oils from refining; fatty alcohols:	
	A. Stearic acid	12%
	B. Oleic Acid	10%
	C. Other fatty acids; acid oils from refining	8%
	D. Fatty alcohols	13%
15.12	Animal or vegetable fats and oils, hydrogenated, whether or not refined, but not further prepared:	
	A. Imported in immediate containers of a net capacity of 1 kg. or less	20%
	B. Otherwise imported	17%
15.14	Spermaceti, crude, pressed or refined, whether or not colored	7%

Listing of duties continued on next page.

International (Contd.):

Duties for Selected Fishery Products in Common Customs Tariff of the European Economic Community (Contd.)		
Tariff Heading Nos.	Description of Goods	Ad valorem Duty Rates
16.04	<u>Prepared or preserved fish, including caviar and caviar substitutes (includes canned products):</u> A. Caviar and caviar substitutes B. Salmonidae C. Herrings D. Sardines E. Other	30% 20% 23% 25% 25%
16.05	Crustaceans and molluscs, prepared or preserved (includes canned products)	20%
23.01	<u>Flours and meals, of meat, offals, fish, crustaceans or molluscs, unfit for human consumption; greaves:</u> A. Of meat and offals; greaves B. Of fish, crustaceans or molluscs	4% 5%
23.07	<u>Other preparations of a kind used in animal feeding:</u> A. Fish and whale solubles	9%
32.09	A. I. Pearl essence	16%

FISHING LIMITS

SOME AGREEMENT REPORTED IN NORWEGIAN-BRITISH TALKS:

Important progress was achieved and a substantial measure of agreement reached in the negotiations between Britain and Norway on fishing limits and fishery relations, according to the statement issued in London and Oslo on July 1, 1960.

The negotiations took place in London from June 23 to 28. The two delegations then indicated they wished to obtain further instructions from their Governments before meeting again.

The statement issued said: "It is confidently assumed by both parties that a final agreement will be reached within the next few months well ahead of any change of the present situation in regard to fishery limits."

Since the talks have been held in the light of Norway's declaration in May 1960 of an intention to extend fishing limits from the present 4 miles to 12 miles, this statement would mean that agreement is expected before Norway puts her intention into practice.

Presumably good progress has been made towards an agreement whereby British trawlers would continue to fish in Norwegian waters during a phasing out period of 10 years while Norwegian claims to exclusive fisheries up to 12 miles would be respected after the phasing out period.

Such an agreement would follow the lines of the Canadian-United States proposal which both Governments supported at the Law of the Sea Conference at Geneva this spring, but which failed by one vote to win general acceptance.

Any Anglo-Norwegian agreement must be capable of being fitted into a wider multilateral agreement, and must not prejudice the present legal position of each side. (Fish Trades Gazette, July 2, 1960.)

GENERAL AGREEMENT ON TARIFFS AND TRADE

SIXTEENTH SESSION OF CONTRACTING PARTIES ENDED ON JUNE 4:

The 42 countries participating in the work of the General Agreement on Tariffs and Trade (GATT) ended their Sixteenth Session in June 4, 1960. This was after three weeks of intensive work in Geneva on current problems of international trade. Noteworthy developments at the Session included announcements by a number of countries on planned reductions of import restrictions; an examination of the European Free Trade Association and the Latin American Free Trade Area; agreement to attack the problems involved in "market disruption" which may be caused by sudden increases in imports of specific commodities; further progress in carrying out the GATT "program for the expansion of international trade;" and agreement on arrangements looking towards the provisional accession of Spain and Portugal to the General Agreement.

During the Session various delegations announced actions they are taking or plan to take in the further removal of import restrictions. According to statements made by representatives of the Netherlands, Belgium, Germany, Malaya, and Italy, these countries will announce new liberalization lists in the near future. It is expected that import restrictions will be removed on a number of products of particular interest in the United States. Furthermore, the United Kingdom and Australia stated that action will be taken looking toward the easing of remaining restrictions. These announcements are particularly gratifying to the United States, which has played a leading role in the drive for the removal of import restrictions by countries which have emerged from balance-of-payments difficulties.

The GATT Balance-of-Payments Committee held consultations before and during the

International (Contd.):

Session with a number of countries (Austria, Brazil, Greece, India, South Africa, and Uruguay) which still maintain import restrictions for balance-of-payments reasons. The United States took an active part in these consultations in order to encourage the maximum possible degree of progress in the further removal of restrictions that hamper the export of American goods.

The Contracting Parties discussed the question of the best way to deal with the import restrictions that may be retained after a country renounces its resort to the balance-of-payments exception in the agreement. There was a consensus that the full influence of the Contracting Parties should be used to minimize the extent of such restrictions and that the existing procedures of the Contracting Parties should be applied effectively and expeditiously to any restrictions that are retained. To expedite action a Contracting Party that emerges from balance-of-payments difficulties should promptly report any residual restrictions to the Contracting Parties, present its plans and policies for dealing with them, and stand ready to consult with other countries whose export interests are affected by the restrictions.

Specific commodity problems were discussed by the United States delegation on a bilateral and informal basis with other delegations, including those of Austria, Belgium, Denmark, Germany, and Italy. The discussions included a number of agricultural and industrial commodities for which American producers and exporters had requested information and assistance regarding trade restrictions. It is hoped these conversations will result in the relaxation of restrictions on United States products in the near future.

The Convention for the Establishment of the European Free Trade Association (EFTA), which had recently been ratified by Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom, was examined by the Contracting Parties in the light of relevant provisions of the GATT. The spokesman for the "Seven" emphasized that the Stockholm Convention had been drawn up with the intention of freeing their trade not only with one another, but also with the rest of the world. He stated that the signatories to the Convention were agreed that their cooperation in the EFTA should be firmly based on the principles of the GATT. The United States representative expressed the belief

that, while certain aspects of the trade arrangements provided for in the Convention raised questions which might call for an adjustment on the part of the member states, the Stockholm Convention on balance deserved the support and approval of the Contracting Parties to the General Agreement. The provisions of the Convention were subsequently examined and discussed in detail by a Working Party, which submitted an interim report. It was agreed that the consideration of the Stockholm Convention should be continued at the Seventeenth Session.

The Latin American Free Trade Area was also discussed at the current Session. This new free trade area was established by the Treaty of Montevideo, signed on February 18, 1960, by representatives of four countries which participate in the GATT (Brazil, Chile, Peru, and Uruguay) and three which do not (Argentina, Mexico, and Paraguay). The spokesman for the signatory governments explained the purposes and the general provisions of the Treaty, emphasizing the conviction that it would contribute to an expansion of world trade. The United States delegation endorsed the Treaty objectives of achieving higher standards of living and accelerating economic development through elimination of intraregional trade barriers and the maximum utilization of productive factors. The signatory governments were assured that the United States would give sympathetic and serious consideration to the Treaty during the GATT review. The Contracting Parties created a Working Party to examine the Treaty in the light of its conformity with the objectives and provisions of the General Agreement.

The European Economic Community (EEC) reported on the progress it has made during the last six months in integrating the six member states. The spokesman stated that the more quickly integration is achieved, the more dynamic, open, and liberal will be the trade policy of the Common Market. In the ensuing discussion the United States and other contracting parties emphasized the importance of liberal trade policies by the Community. The United States and other agricultural exporters expressed concern about some of the agricultural proposals now under consideration in the EEC and stressed the need for assuring the highest possible level of international trade in agricultural products. In a separate statement a Commission spokesman discussed the Commission's preparations for participation

International (Contd.):

in the 1960-61 tariff negotiations, which, to a large degree, will be concerned with the new EEC common external tariff.

There is serious concern that sharp increases in imports in a narrow range of commodities could have adverse economic, political and social repercussions in some importing countries. As a result, quantitative restrictions on trade, particularly against manufactured exports coming from Japan and the less developed countries of Asia, continue to be widespread.

To meet these two related problems the Contracting Parties laid out a broad work program with the view to finding practical ways to facilitate an expansion of trade while avoiding possible adverse effects stemming from sharp increases.

The new program designed to deal with the problem of "the avoidance of market disruption" will be undertaken by a special Working Party established at the Session. Its first task will be to consider certain factual material already compiled by the GATT Secretariat on instances of possible market disruption, and to suggest multilaterally acceptable solutions consistent with the GATT principles for those problems which call for immediate action. The Working Party will try to develop suitable and temporary safeguards which would prevent market disruption and would permit further progress in eliminating the restrictions which now limit exports from Japan and the less-developed countries.

The second part of the Working Party's program will consist of a study of the basic factors involved in problems of market disruption.

The study will include an examination of the relevance to international trade of differences in wages, social changes and productivity among countries. In making arrangements for the study, the Working Party is expected to draw upon the services of experts in the field and of the International Labor Office.

At the 16th Session, the Contracting Parties reviewed the work of two special committees which had been set up to help promote the expansion of international trade and which had been meeting between sessions.

Committee II continued its consultations with individual countries on their agricultural policies as part of its work in carrying out its mandate to explore ways of expanding agricultural trade. Since the consultations began last September, 29 countries have been consulted, including the most important agricultural exporters and importers. This phase of the work is soon to be completed. The data gathered on a country basis will now be studied commodity by commodity to focus attention on the specific obstacles to expanding trade in particular products.

Committee III is seeking ways to expand the export earnings of the less-developed countries, thus accelerating their development and enabling them to be less dependent on foreign aid. The Contracting Parties approved the report of the Committee's March meeting where principal obstacles to increased exports of the less-developed countries had been identified. These consisted of high levels of revenue duties and internal fiscal charges, higher tariffs imposed on imports of processed goods compared to raw materials, tariff preferences, severe quantitative restrictions some of which discriminate against less-developed countries, state monopolies, and price-support policies of the industrialized countries. The Committee will examine the progress the industrial countries make in reducing these obstacles.

During the Session just ended, Portugal and Spain announced their desire to accede to the General Agreement. There was widespread support for these applications. It is anticipated that Portugal and Spain will engage in the negotiation of tariff concessions during the GATT Tariff Conference to be held in Geneva beginning September 1, 1960.

In addition, the GATT Executive Secretary was asked to begin consultations looking towards the eventual accession to the GATT of the newly-independent countries of Cameroon and Togo.

The Contracting Parties discussed the meetings held in Paris in January and March 1960 on economic matters. These meetings, attended by the 18 OEEC countries, the United States, Canada, and the Commission of the EEC, considered the reconstitution of the OEEC and certain European trade matters. The discussion of this item at the 16th Session centered mainly on the proposal for a new Organization for Economic Coopera-

International (Contd.):

tion and Development (OECD). Some concern was expressed by the Contracting Parties which would not be participating in the new organization about the role of the OECD in the trade field. The United States delegation reaffirmed its view that the GATT had a primary position in the field of international trade. Other delegations whose governments are participating in the Paris meetings also assured the Contracting Parties that it was not the intention to weaken in any way the position of the GATT. It was also made clear that any actions in the trade field would be in accordance with the provisions of the GATT. As evidence of their determination to observe GATT principles, the participating governments pointed to the fact that the Executive Secretary of the GATT took part in the discussions in Paris.

The Contracting Parties also dealt with technical reports which had been prepared by Groups of Experts regarding restrictive business practices, subsidies, state trading enterprises, and anti-dumping and countervailing duties.

**ADDITIONS TO UNITED STATES
LIST OF ITEMS FOR TRADE
AGREEMENT NEGOTIATIONS:**

The United States in June made public an extensive list of imported commodities, including fishery products, on which it will offer to make tariff concessions in international negotiations at Geneva in September 1960. The following fishery items were not listed previously:

proved a proposal for the establishment of a Council.

Under the terms of a Decision, adopted in plenary session, a "Council of the Representatives of the Contracting Parties to the General Agreement" has been established. It is composed of representatives of all contracting parties willing to accept the responsibilities of membership in the Council.

In the course of the discussion in plenary session a number of delegates gave wholehearted support to the proposal to establish the Council. It was pointed out that this extension of the organization of the GATT would undoubtedly result in a more efficient handling of the business of the Contracting Parties.

The functions of the Council will be:

(1) To consider matters arising between sessions of the Contracting Parties which require urgent attention, and to report thereon to the Contracting Parties with recommendations as to any action which might appropriately be taken by them.

(2) To supervise the work of committee, working parties, and other subsidiary bodies of the Contracting Parties operating inter-sessionally, providing guidance for them when necessary, examining the reports of such bodies, and making recommendations thereon to the Contracting Parties.

(3) To undertake preparation for sessions of the Contracting Parties.

Tariff Par.	SCHEDULE A Stat. Class. (1959)	Brief Description	Duty July 1, 1958	U. S. Imports 1959 US\$1,000
66	8420 270	Pearl essence	11%	761
1509	9724 000	<u>Pearl or shell buttons:</u> Fresh water	1 $\frac{3}{4}$ ¢ line per gross plus 25%	97
	9724 100	Ocean	1 $\frac{3}{4}$ ¢ line per gross plus 25%	456
	9724 200	Button blanks, not turned, faced or drilled.	1 $\frac{3}{4}$ ¢ line per gross plus 25%	9

Note: See Commercial Fisheries Review, August 1960, p. 39.

**COUNCIL ESTABLISHED TO
CONSIDER MATTERS ARISING
BETWEEN SESSIONS:**

The Contracting Parties to the General Agreement on Tariffs and Trade (GATT) ap-

(4) To deal with such other matters with which the Contracting Parties may deal at their sessions, and to exercise such additional functions with regard to matters referred to above, as may be expressly delegated to the Council by the Contracting Parties.

If a contracting party considers it is adversely affected by the exercise by the

International (Contd.):

Council of any of its aforementioned functions which involve recommendations to individual contracting parties or the making of determinations or taking of decisions, it may suspend the operation of such action by the Council through the submission of a written appeal therefrom to the Contracting Parties.

Regarding procedural matters, the Council will select its own officers. It will be permitted to establish such subsidiary bodies as it considers appropriate to carry out its functions.

INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS

MEETING HELD IN HAMBURG, GERMANY:

Delegates from 10 countries attended meetings of the executive and scientific committees of the International Association of Fish Meal Manufacturers in Hamburg, Germany.

A Food and Agriculture Organization (FAO) observer attended the meeting of the scientific committee, and it was later announced that arrangements had been made for cooperation between FAO and the association on matters of mutual interest.

Other plans advanced were those for the interchange of scientific information and the provision of technical advice to manufacturers.

INTERNATIONAL PACIFIC SALMON FISHERIES COMMISSION

FISHWAY BUILT IN 1955 AIDS FRASER RIVER TRIBUTARY SALMON ESCAPEMENT:

The delay in this year's spring flood in the Fraser River is the same as that which created a serious obstruction to the Early Stuart run of sockeye in 1933 and 1955 near Yale, British Columbia. The immediate construction of a fishway by the International Pacific Salmon Fisheries Commission after the occurrence of the obstruction in 1955 has more than paid for itself during the first two weeks of July by successfully passing the Early Stuart escapement. If the Yale fishway had not been in operation, a serious decline in the returning run in 1964 would be a foregone conclusion. The unsladdered obstruction in 1955 reduced a spawning escapement of 35,000 fish to only 2,170 poor-quality spawners.

In spite of a complete closure to fishing in 1959, only 2,663 sockeye returned from the

1955 crop to spawn, thus necessitating another complete fishing closure in 1963 to permit full rehabilitation. The economic importance of having the Yale fishway in operation is obvious, the Commission reported on July 14, 1960.

* * * * *

SUCCESSFUL SOCKEYE SALMON SPAWNING FROM 1958 RUN TO ADAMS RIVER INDICATES GOOD RETURN IN 1962:

Widespread interest has been expressed throughout the salmon fishing and canning industry regarding the International Pacific Salmon Fisheries Commission's findings and opinions in respect to the success of reproduction of the 1958 "Adams River run" and what may be expected as a return of a adult salmon in 1962.



Salmon on their nest.

The isolation and assessment of the factors controlling total survival of sockeye is a relatively new study and while considerable progress has been made in the field by the Commission, any conclusions must be examined with caution.

Final estimates of the 1958 Fraser River system run approximate 19 million sockeye salmon, 15 million being produced in the South Thompson watershed ("Adams River run"). Of the 15 million fish, 72.3 percent or over was produced in Lower Adams River proper while 27.7 percent or less was produced in Little River and the South Thompson River below Little Shuswap Lake.

An examination of historical records indicate that the 1958 "Adams River run" may have exceeded an all-time record in production. The timing and size of the 1954 escapement was very favorable and spawning, incubation, and rearing conditions were excellent. In addition, sea survival probably approached a maximum which has not been equalled in the last ten years. With all factors favorable for the good survival of the 1958 run, it must be concluded that the pos-

International (Contd.);

sibility of a similar Adams River run re-occurring falls in the same category as the 50- or 100-year flood.

While the abundance of the 1958 Adams River run cannot be expected to reoccur except by chance, mistakes in regulation can cause unnecessary and drastic declines in survival. Data collected by the Commission demonstrate that if emergency and timely action had not been taken, the 1962 Adams River run would be a serious failure.

Unlike the parent 1954 run, the 1958 run was 10 days late in their arrival in the fishery. The run was extended and a large percentage of the escapement reaching the delay area off the mouth of the Fraser River consisted of fish of the latter part of the run. Regulation in the river was controlled to permit the first peak of escapement to reach the spawning grounds. These were healthy fish and were in top condition as many industry observers can testify. After the proper number of fish had escaped, at least 1.5 million fish of the latter part of the run remained to be caught. These fish likewise escaped because of a price dispute in the fishery. Their upstream migration was greatly extended with several hundred thousand failing to reach their spawning grounds. The late spawners arriving at the spawning grounds, estimated at over 1 million sockeye, were prevented from entering Adams River by an electric fence. These fish spawned on the shores of Shuswap Lake and in Little River which had already been fully seeded by good quality spawners.

Winter surveys revealed an excellent hatch in Adams River--none on the shores of Shuswap Lake (exposed by winter low water) and very few in Little River. It is quite apparent to the investigators that the bulk of the return in 1962 may be attributed to the installation of the electric fence. Had the fence not been installed, a failure in the 1962 run would have been a foregone conclusion irrespective of the degree of sea survival.

Observations by the Commission staff during the 1960 spring months have revealed a very substantial seaward migration of yearling sockeye from Shuswap Lake. Due to the volume of flow in the South Thompson, it is not possible to devise an accurate enumeration of the downstream migration. Indices

established in the spring of 1956, when the 1958 fish went to sea as yearlings, could not be used this year because of very adverse weather conditions and the resulting change in the character of the downstream migration. It can only be concluded from extensive field observations that this spring's migration was substantial--the Commission staff believes it to be less than that which produced the 1958 run. The size of the migrants for the two migrations compared favorably, indicating that rearing conditions in the lake were good.

If the sea survival of the two migrations being compared were approximately equal, it may be stated with confidence that a substantial run will return in 1962 although it would not equal that of 1958. Unfortunately, sea survival cannot as yet be accurately predicted, but it should not approach the record established by the 1958 run, thus causing a further diminution in the comparable size of the returning run.

Further estimates on the eventual size of the 1962 run will not be available until the fall of 1961 when the 3-year-old jack sockeye have returned to the spawning grounds. Whatever the size of the 1962 run, the Commission staff firmly believes that the electric fence placed in the mouth of Adams River forestalled a very serious failure in the success of reproduction. This conclusion is properly based on the excellent hatch in Adams River where the escapement was controlled by the fence and the very poor hatch in Little River where spawning was not controlled.

INTERNATIONAL WHALING COMMISSION

WHALING CONVENTION
RATIFIED BY ARGENTINA:

The International Whaling Convention and schedule of regulations, signed at Washington December 2, 1946, and entered into force on November 19, 1948, has been ratified (with a reservation) by Argentina. Ratification was deposited on May 18, 1960.

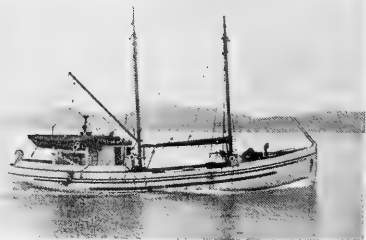
Argentina on the same date also deposited its adherence (with a reservation) to the protocol amending the International Whaling Convention of 1946, done at Washington November 19, 1956, and entered into force on May 4, 1959.

International (Contd.):

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT FISHING ENDED IN MAJOR AREAS:

Areas 2 and 1B Closed: The closure of the first fishing season in North Pacific halibut Areas 2 and 1B effective at 6 a. m. (P. S. T.) July 31, 1960, was announced by the International Pacific Halibut Commission on July 22, 1960. The Commission estimated that the 26.5-million-pound limit set for Area 2 would have been caught by the closing date. Area 1B, which has no catch limit, was also closed when the quota for Area 2 was attained.



A typical Pacific Coast halibut schooner.

Areas 2 and 1B this year were open to halibut fishing for 91 days, as compared with 68 days in 1959, 59 days in 1958, and 47 days in 1957. These same areas were fished for 38 days in 1956 (fishing started May 20), 24 days in 1955, 21 days in 1954, and 24 days in 1953.

The longer period required to catch the Area 2 catch limit this season is attributed to lighter catches and fewer vessels fishing the area.

The second fishing season in Areas 2 and 1B began at 6:00 a. m. (P. S. T.) September 11, for a period of 7 days without a catch limit. After 6 a. m. (P. S. T.) September 18, the areas were closed to halibut fishing until the commencement of the halibut fishing season in 1961. Area 2 includes all convention waters between Willapa Bay, Wash., and Cape Spencer, Alaska. Area 1B includes all convention waters between Willapa Bay, Wash., and Heceta Head, Oregon.

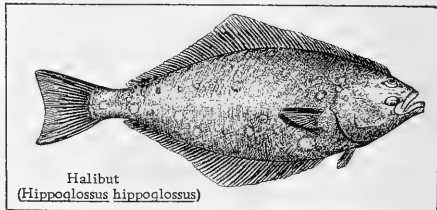
Halibut landings from Area 2 as of July 19, 1960, totaled 24.3 million pounds. In 1959 Area 2 closed on July 8. This is the first year that Area 3A closed before Area 2. Area 1B fishing seasons are identical to those for Area 2.

Area 3A Closed: Fishing in Pacific Halibut Area 3A ended at 6 a. m. (P. S. T.) on July 25, 1960. The Commission announced the closing of that area on July 5, since it estimated that by July 25 the catch limit of 30 million pounds for Area

3A would be reached. As of July 19, 1960, the landings of halibut from Area 3A were 25.6 million pounds. The Area 3A closure this year is 7 days earlier than in 1959 when fishing ended on August 1. In 1958 fishing in Area 3A stopped on August 31 and in 1957 on September 22.

Area 3A includes the waters off the coast of Alaska between Cape Spencer and Shumagin Islands. There will be no fishing in Area 3A until the season reopens in 1961.

This year Area 3A was open to fishing for 85 days as compared with 92 days in 1959. In 1958 the area was open to fishing for 92 days and in 1957 for 144 days (the longest season for the area since 1945 when the area was open to fishing for 147 days). Between 1945 and 1955 the trend had been towards a shorter season, but then the trend reversed itself and through 1957 the seasons were longer. However, beginning in 1958 the trend was reversed again and the seasons have become shorter. Area 3A was open for halibut fishing for 104 days in 1956, 81 days in 1955, 58 days in 1954, 52 days (shortest on record) in 1953, 60 days in 1952, 56 days in 1951, 66 days in 1950, 73 days in 1949, and 72 days in 1948.



Halibut
(*Hippoglossus hippoglossus*)

The official opening date for all halibut fishing in the North Pacific regulatory area this year was May 1 at 6:00 a. m. (P. S. T.), except that fishing in Area 3B commenced on April 1.

The fishing season in Areas 1B and 3B will continue until 6:00 a. m. (P. S. T.) October 16. Area 3B includes all waters west of Area 3A including the Bering Sea. Area 1A is south of Heceta Head, Oregon.

Under authority of the Convention between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea, this year's regulations became effective March 24, 1960.

**Aden Colony**FISH LANDINGS INCREASED IN 1959:

Landings of fish in the Aden Colony were good in 1959, resulted in increased income during the year, and contributed to a holding down of the cost of living. Fish constitutes an

Aden Colony (Contd.):

important item of diet in the Colony. Six additional motorized fishing boats were added to the Colony's fleet of those craft which numbered 60 as of late May 1960. The Fisheries Department continued its policy of aiding fishermen through loans to mechanize their boats.

Aden's Landings of Food Fish by Principal Species, January-October 1958-59

Species	January-October	
	1959	1958
	.. (1,000 Lbs.) ..	
Mackerel	893	1,010
Kingfish	633	215
Little tuna	61	44
Bluefin tuna	75	77

Nylon and synthetic fibres are being employed to an increasing extent and financial assistance is being given to fishermen to purchase better equipment through the Cooperative Fishing Gear Supply Society. (United States Consulate, Aden, May 25, 1960.)



Argentina

FROZEN FISH NOW BEING SOLD FOR FIRST TIME:

Frozen fish have been offered in Argentine retail markets since about April 1, 1960, for the first time. The fish are processed by a Mar del Plata firm, an established producer of canned fish and fishery byproducts. Five varieties of fish are now frozen--fillets of hake, "cornalitos," anchovies, swordfish, and squid. All are marketed in packages containing 400 grams (about 14 ozs.) of fish.

The processing firm has installed a freezing plant in one of its two factories located in the fishing port of Mar del Plata. The deep-freezing equipment was imported from the United States, and a special filleting machine was purchased in Germany. The fish are quick-frozen at a temperature of -40° C. (-40° F.). This firm does not maintain its own fishing vessels but purchases fish from the Mar del Plata fleet.

The company reports that the frozen fish have been well received although the project is still in the trial stages and the fish have been offered only in Buenos Aires. Approximately 40,000 packages were sold during April and May. Wholesale prices range from

11.90 pesos (about 14.3 U. S. cents at exchange rate of 83.2 pesos to US\$1) for the package of "cornalitos" to 27.50 pesos (about 33.0 U. S. cents) a package for the squid. In order to promote this new product, the firm has engaged in a newspaper advertising campaign stressing the convenience and flavor of frozen fish and offering suggested recipes. Production is to be increased soon and additional varieties of fish will be offered.

Two serious problems must be overcome, according to company representatives, before large sales increases can be expected. In order to sell frozen fish, grocers must have freezer-display cases capable of maintaining a constant temperature of at least -20° C. (about -4° F.); very few stores now have such freezers which cost approximately 30,000 pesos (about US\$361) each. The fish-freezing firm is encouraging grocers, delicatessens, and fish markets to obtain these freezers. Sales of frozen fish are now limited to about 180 stores which have deep freezer display cases. An equally difficult problem is presented by the traditional reticence of the Argentine public to consume fish. The firm hopes to overcome this obstacle through advertising, according to a June 27, 1960, report from the United States Embassy in Buenos Aires.



Australia

BANS CANNED WHITING IMPORTS FROM UNITED KINGDOM:

After October 1, 1960, Australia banned imports of canned fish fillets labeled "whiting" from Great Britain because the whiting (*Gadus merlangus*) is different from the high-priced quality fish known as whiting in Australia. The technical names of the principal varieties of Australian whiting are: *Sillago ciliata*, *Sillago noides punctatus*, and *Sillago bassensis*. The total Australian whiting catch in 1957/58 was three million pounds round weight. (United States Embassy, Canberra, July 1, 1960.)

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CLOSED SEASON FOR FEMALE SPINY LOBSTERS:

From June 1 to October 31, inclusive, the taking of female spiny lobsters (*Jasus landii*) in the territorial waters of Victoria and Tasmania, Australia, and in the adjacent

Australia (Contd.):

Commonwealth waters, is prohibited. The closure will apply in future years as of the same dates.

In 1959 the closure was from August 1 to November 30 for that year only, but it was announced that the future yearly closure would be from June 1 to November 30. The dates finally agreed upon are June 1 to October 31. (Australian Fisheries Newsletter, June 1960.)

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PREPACKAGED FROZEN FISH IMPORTED FROM GREAT BRITAIN:

Prepackaged frozen fish is being shipped to Australia from England and Scotland. Trade in Australia for prepackaged fish is expanding rapidly.

The fish is imported in Australia by the biggest food-processing organization in the Southern Hemisphere, with headquarters at Bathurst, New South Wales. The export manager said: "Our imports of fish from Britain have increased by 500 percent in the last three months, and we expect to buy about £1,000,000 (US\$2.8 million) worth within the next 12 months."

The fish, which are enjoying growing popularity in Australia, include whiting, flounders, and bream from Liverpool, Grimsby, Glasgow, and London. (Fish Trades Gazette, May 21, 1960.)



Brazil

EXPORTS OF SPINY LOBSTERS SET RECORD IN APRIL:

Exports of spiny lobsters from Recife, Brazil, to the United States set a new record of 50,236 pounds during April 1960. The month of April is usually considered to be part of the "off season" by Brazilian fishermen, the United States Consulate at Recife reported on June 22, 1960.)

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INSPECTOR TO BE PLACED ABOARD JAPANESE TUNA FISHING VESSELS:

A large Japanese fishing company presently has a contract with the Brazilian Govern-

ment which permits three of their vessels to base in Recife and fish Brazilian waters in exchange for selling their catches of tuna with in Brazil. There have been increasing complaints about these refrigeration-equipped vessels returning to Recife after several weeks at sea with empty holds. The Commander of the Third Brazilian Naval District suspects that the Japanese land their catch of tuna in Trinidad where it is sold on a "free market" basis.

The Commander now plans to place one of his sailors aboard each such foreign-controlled vessel as a passenger and inspector. The Brazilian Navy also uses a total of six corvettes to patrol the northeastern waters and the fishing industry. (United States Consulate at Recife reported on June 22, 1960.)



British North Borneo

FISHERIES TRENDS, JUNE 1960:

There is very little information on the landings of fish and shellfish in the British Colony of North Borneo. However, some statistics are maintained on the export trade in marine products. In 1959, North Borneo

British North Borneo Exports of Marine Products, 1959			
Product	Quantity	Value	
		Malayan	US\$
	1,000		1,000
	Lbs.	\$1,000	
Fish, fresh or frozen	1,410	343	112
Fish, dried or salted	1,157	377	124
Shellfish (shrimp, clam meats, etc.)	187	120	39
Fish and shrimp meal	617	60	20
Pearl, tochus, and green snail shells	653	530	174
Other	46	75	22
Total	4,070	1,495	491

1/Includes turtle shell and eggs, fish roe, trepang, fish skin and gills, and dried sea horse.

exported about 4.1 million pounds of marine products valued at about US\$491,000. As compared with 1958, the exports were higher by about 1.3 million pounds in quantity and US\$88,500 in value.

Marine fishing in British North Borneo (in the past mainly confined to inshore waters and estuaries), with an increase in use of power boats, has now been gradually extended to offshore waters. Three different methods of deep-sea fishing have been introduced and of the three, otter trawling is firmly established as catches have been and still are good. The other methods, namely: beam trawl for shrimp and rod-and-line fishing with use of live bait for tuna, have only been tried out recently and

British North Borneo (Contd.):

catches so far proved satisfactory. Trials on the use of the Hong Kong-type beam trawl for shrimp were carried out in the areas outside Sandakan Harbour. Results have been found to be promising.

A 210-ton Japanese tuna vessel, complete with live bait for bonito and tuna fishing with pole and line, arrived about June 1960 to try out fishing in the areas South of Si Amil Island. Catches have proved extremely good. Species of tuna caught were mainly skipjack or striped tuna and a small percentage of yellowfin tuna.

Fourteen fish ponds (covering a total of 4.03 acres) were constructed and stocked during 1959. The majority were situated in the Keningau and Tenom districts of the Interior Residency. Total number of fish ponds in the Colony at the year's end was 660 covering an area of 44.1 acres.

Total production of pond fish in 1959 was estimated at 18 tons. Retail prices for good pond fish (sold alive), although varying between different districts, was generally high. This, combined with a steady demand, did much to encourage the industry.

Yield of tilapia in "monosex" culture increased from 1,866 to 2,133 pounds per acre per year by adjusting the stocking rate. More and more fish farmers are adopting this method; there were $4\frac{1}{2}$ acres of ponds in Keningau and $2\frac{3}{4}$ acres in Tenom stocked with male tilapia at the end of 1959. (United States Consulate, Singapore, June 29, 1960.)



Canada

VALUE OF BRITISH COLUMBIA FISHERIES DOWN SHARPLY IN 1959:

During the height of British Columbia's 1959 summer fishing season the entire industry was paralyzed as a result of a dispute between the fishermen and shoreworkers and salmon industry management over the price of salmon and wages for shoreworkers. Nevertheless, during the off-cycle sockeye salmon year of 1959, British Columbia fishermen caught more salmon than expected and exceeded the catch of the last cyclical year of 1955. It is estimated that the wholesale value of fish products marketed in 1959 will be a-

bove C\$66.5 million as compared to \$98 million in 1958, which was a very good year.

During the last three months of 1959, fishermen landed good catches of herring, which is second to salmon in value. However, depressed world oil and meal prices resulted in the reduction plants refusing to purchase any more herring after mid-December, effectively closing the season.

Halibut landings were up nearly one million pounds in 1959 as compared to 1958 which had a slightly longer fishing season. However landed values for halibut were down in 1959 from the preceding year due to a decline of about two cents a pound in average prices.

The restoration of sterling convertibility in the dollar area resulted in the United Kingdom becoming a ready buyer of British Columbian fishery products. British Columbia now sells more fish products to the United Kingdom than to the United States. In the first nine months of 1959, the United Kingdom imported \$11,530,965 worth of fish products as compared to United States imports of C\$9,629,500. During the same period, exports to countries of the European Common Market were good. (United States Consulate, Vancouver, June 14, 1960.)



Chile

PRODUCTION, FOREIGN TRADE, AND CONSUMPTION OF WHALE AND SPERM OIL:

Chilean whale and sperm oil production shows a steady increase for the period 1957-60. Domestic consumption and exports also show an upward trend since 1958, although exports are expected to drop 23.1 percent in 1960 as compared with 1959. Imports are negligible.

Table 1 - Chile's Whale and Sperm-Oil Production, Exports, and Domestic Consumption, 1958-1960

Year	Production	Exports and Domestic Consumption	
		Exports	Domestic Consumption ^{1/}
1960 ^{2/}	8,600	200	8,400
1959 ^{3/}	8,400	2/260	8,140
1958 ^{4/}	7,800	120	7,680

^{1/}Breakdown into edible and industrial use not available, but bulk enters into manufacture of margarine.

^{2/}Forecast.

^{3/}Preliminary.

^{4/}All shipped to Germany.

^{5/}Revised.

Chile (Contd.):

The number of whales caught in 1959 totaled 2,620--the largest catch on record. In 1958, a total of 2,280 whales were caught and in 1957 a total of 2,512. Most of the whale

Table 2 - Products of Chilean Whale Catch, 1957-1959

Products	1959	1958	1957
		(Metric Tons)	
Sperm oil	4,600	4,000	4,200
Whale oil	3,800	3,300	3,480
Total	8,400	17,300	7,680
Meat	250	210	220
Whale meal	1,400	1,020	1,050
Bone oil ²	1,900	1,600	1,800

¹/Evidently the revised figure in table 1 is more accurate.

²/Includes a small amount from species other than marine animals.

catch consists of sperm whales. (U. S. Foreign Agricultural Service Report, Santiago, April 25, 1960.)



Cuba

RESOLUTION RESTRICTS OYSTER HARVESTING:

The Cuban National Fishery Institute in a resolution published in the Official Gazette (Annual No. 102), May 30, 1960, restricts as of June 1, 1960, the exploitation of oysters (Crassostrea rizophorae) on all Cuban coasts, except in the Provinces of Camaguey and Oriente. Continued harvesting is permitted on the coasts of those two latter provinces, but the transport and marketing of oysters obtained in those provinces must be covered by a permit. The Resolution states that oysters were being overexploited on commercial oyster beds in the western part of Camaguey Province, resulting in the reduction in the average size. (United States Embassy in Havana, July 1, 1960.)



Egypt

REFRIGERATED TRUCKS FOR FISH TRANSPORT:

The Egyptian General Authority for Storage Affairs has received an appropriation of £E35,000 (US\$99,330) from the budget for the purchase of five refrigerated trucks. The new trucks will be used to transport fresh fish from Suez to other parts of Egypt. The trucks will be part of a larger program for establishing cold-storage centers and other-

wise expanding and improving the fisheries industry. (United States Consulate, Port Said, July 5, 1960.)



German Federal Republic

FISH PROCESSING WORKERS AT HAMBURG GET WAGE INCREASE:

Negotiations between the West German Food Workers Union and representatives of the Hamburg fish processing industry resulted in a wage increase of DM 0.11 (about 2.6 U. S. cents), or about 5 percent, per hour, for workers in that industry retroactive to June 1, 1960. The increase would raise the hourly rate for those workers to about 55.4 U. S. cents an hour. (United States Consulate, Hamburg, June 23, 1960.)

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IMPORTS OF FISH OILS, 1953-1959:

In 1959 West Germany's imports of marine fats and oils remained practically on the same level as in 1958. The share of edible marine oils in total fat and oil imports continued to decline due to a decline in use of marine fats and oils and a growing preference for vegetable oils by the margarine industry.

Year	West German Imports of Fish Oil, 1953-59		Percent Imported from U. S.
	Total Imports	Imports from U. S.	
	. (1,000 Metric Tons) .		Percent
1959	65.0	22.0	33.8
1958	64.3	21.3	33.1
1957	67.0	28.5	42.5
1956	84.0	39.0	46.4
1955	67.9	31.8	46.8
1954	109.2	34.2	31.3
1953	82.7	32.4	39.2

Source: West German Federal Statistical Office.

The United States share of West Germany's imports of fish oils, except for a slight increase in 1959 over 1958, has been declining steadily since 1955.

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MORE ORDERS PLACED FOR STERN-TYPE TRAWLERS:

The West German fisheries have during the last two years put into operation a total of four stern-type trawlers. In addition, five West German deep-sea fishing companies have placed orders in recent months for 12 more stern trawlers. These orders form more than 50 percent of the 23 orders for deep-sea fishing vessels on the books of West

German Federal Republic (Contd.):

German shipyards as of late April 1960. The remaining 11 trawlers, which are all conventional, are the last of an earlier large-scale building program. The West German fishing companies for which these vessels are being constructed have indicated that any future orders will be for stern trawlers.

It would appear, therefore, that the West German fishing trade has become convinced that the stern trawler offers definite advantages over the conventional side-trawler. From experience gained from the operation of stern-type trawlers, it is probable that the West German fishing companies have found them more profitable than the side-type trawlers. (United States Consulate, Bremen, April 27, 1960.)



Ghana

NEW FACILITIES FOR FISHING INDUSTRY:

The Government of Ghana is trying to increase fish production in several ways. A cooperative fish marketing center with cold-storage facilities was opened by the Agricultural Development Corporation at Takoreddi on May 18. The new fishing harbor at Elmina is now in operation and a large fish landing area with complete facilities will be available before the end of this year at the new port of Tana. The Government is encouraging canoe-fishermen to acquire outboard motors. A National Fishing Industries Board is to be established, presumably with Government capital, to promote further development in this important field. (United States Embassy, Accra, July 11, 1960.)



Iceland

FISHERIES AIDED BY NEW LAWS:

Certain laws affecting the fishing industry were passed by the Icelandic Parliament (althing) before it adjourned June 3 until October 10, 1960.

The Price Control Act reorganizes price administration, including the establishment of a new price control committee made up of two Independence Party members, one each

from the other three parties, and the Under Secretary of the Ministry of Commerce.

A bill providing for limited and controlled drag-net fishing for flounder within the 12-mile limit was also passed. This aroused considerable opposition from conservation advocates.

A step toward additional fish-quality control was voted to set up an inspection system for fresh and iced fish. This reflected strong recent demands in and out of the Parliament for measures to improve the quality of fish for export.

Both the fisheries and the shipyards are expected to benefit from another act which for the first time will permit loans from the Fisheries Fund direct to Icelandic shipyards for fishing vessel construction. (United States Embassy at Reykjavik, June 10, 1960.)

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NORTH COAST HERRING FISHING SEASON UNDER WAY:

Early in June 1960, active preparations were under way for the opening of the Iceland north coast herring season.

The Coast Guard research vessel *Aegir* completed a survey which indicated a plentiful supply of plankton. Several herring plants have chartered a Norwegian vessel to shuttle the fish from fishing vessels to processing plants ashore. About 40 percent of the herring vessels have recently installed a new type of net-retrieving gear, patented in the United States.

Contracts for deliveries of north coast salted herring approximate those of last year: Soviet Union 80,000 bbls., Finland 51,000 bbls., West Germany 5,000 bbls., and Denmark 3,000 bbls. The Swedish contract for 85,000 bbls. was at a less favorable price, but was for 25,000 bbls. more than the 1959 contract.

A Herring Production Board representative is also attempting to conclude sales contracts in the United States. The 1959 Icelandic export to the United States was unusually small, amounting to only 94.5 metric tons. (United States Embassy at Reykjavik, June 10, 1960.)

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Iceland (Contd.):

FISHERIES TRENDS, JUNE 1960:

Total landings during the first four months of 1960 by Icelandic fisheries amounted to 201,103 metric tons as compared with 193,018 metric tons for the same four-months period of 1959. More cod and haddock were landed than ocean perch, which is a reversal of the 1959 trend.

The north coast Icelandic herring season was well under way at the end of June with landings up about fourfold from the same period of 1959. The 1959 North Coast herring fishery season was very good. On June 27, the Herring Production Board announced that the salting of herring could commence. Due to the low fat content of the earlier landings, most went to fish meal and oil reduction plants.

The good news regarding the over-all fish catch as well as the start of the herring season was clouded by the knowledge that fish oil and meal prices are extremely poor. Practically all storage facilities for both oil and meal in Iceland are filled with unsold stocks.

The Icelandic Freezing Plants Corporation announced on June 24, 1960, that it had concluded a contract for the sale of 2,500 tons of frozen herring to West Germany. Although the price was said to be somewhat lower than that received in Eastern Europe, the importance of gaining a foothold in that new market was stressed.

On June 17, the Iceland Foreign Office announced that Iceland had signed a multilateral trade and payments arrangement with Finland thus joining 13 other Western European countries in becoming a member of the "Helsinki Club." The agreement took effect on December 29, 1959.

In January this year, Iceland and Finland agreed to scrap the old bilateral barter trade agreement between the two countries. Icelandic salted herring will now enter free from Finnish import license requirements, the United States Embassy in Reykjavik reported on July 1, 1960.



India

UNITED NATIONS SPECIAL FUND
ALLOCATION TO INDIA FOR
FISHERIES TRAINING INSTITUTE:

The Governing Council of the United Nations Special Fund on May 27 approved a program of 30 new projects and included among them was one of interest to fishery interests.

On the recommendations of a committee appointed to assess and review the training of fisheries officers, the Government of India has decided to establish a Fisheries Training Institute to train district fisheries officers for the Central and State governments and managers for the fishing industry as well as training instructors. There will thus be provided trained leaders in the techniques of developing and exploiting inland and marine fisheries. Such training could also be offered to applicants in other countries in southeast Asia. The Institute will be equipped with laboratories, a library and workshops, a fisheries training vessel, and an auxiliary boat, machinery and gear.

The Special Fund allocation is \$610,300 and the Indian Government's counterpart contribution is the equivalent of \$730,000. The duration of the project is three years and the executing agency is the Food and Agriculture Organization. The Special Fund will assist the Government of India in providing the services of experts, equipment, and fishing gear. The Indian Government contribution will provide counterpart personnel, buildings, fishing craft, and the payment of overhead costs.



Indonesia

FISHERIES LANDINGS IN
NORTH SUMATRA HIGHER IN 1959:

According to the Fisheries Department of the Indonesian Province of North Sumatra (which is comprised of East Sumatra and Tapanuli), landings of fishery products in that area in 1959 totaled 62.3 million pounds, valued at Rp.225.4 million (about US\$7.1 million), as compared to 53.3 million pounds in 1958. The comparatively favorable weather conditions during 1959 were given as one reason for the larger catch.

Indonesia (Contd.):

During 1959, 40,456 fishermen (including 9,699 part-time fishermen) were engaged in the fishing industries in North Sumatra, of whom four-fifths were in East Sumatra alone. A total of 8,931 fishing vessels were used in North Sumatra of which 355 were motorized.

Most of the fishing enterprises (a total of 425) operating in East Sumatra are Chinese-owned, with only 64 Indonesian-operated. Of the 202 fishing enterprises in Tapanuli, only 3 were Chinese-owned.

For the past years plans have been made with United States help for the modernization of the fisheries of North Sumatra by using trawlers and long-lines. However, the plans have not been carried out because of the non-availability of funds from the Indonesian Government. The United States fisheries adviser stationed in Medan has returned to the United States and has not been replaced. (United States Consulate in Medan, June 24, 1960.)



Japan

CANNERS AND EXPORTERS AGREE ON CANNED TUNA EXPORT PRICE:

Japanese tuna canners and traders in July settled the export price for canned tuna-in-brine. Canners agreed to cut the whitemeat price \$1 to US\$9.15 a case for the next sale (in July), but asked that it be raised to \$9.25 a case for the August sale. They want the 1 lightmeat price held to the present \$6.80 for the next sale (in July), and then raised to \$7 for the sale after that (in August). The traders accepted this plan. The July sale included 200,000 cases of white meat and 100,000 cases of lightmeat--the total for this year through July was 810,000 cases of whitemeat and 770,000 cases of lightmeat.

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MOTHERSHIPS TUNA FISHING OFF FIJI ISLANDS REPORT GOOD CATCHES:

The two Japanese mothership fleets fishing tuna off the Fiji Islands were continuing to make good catches. As of mid-July the No. 3 Tenyo Maru had taken aboard 3,340 tons, while the Nojima Maru had produced 3,800 tons.

The Tenyo Maru ceased receiving fish from July 12 to 16, in order to put 600 tons of tuna aboard the carrier No. 31 Banshu Maru, but was to begin taking fish from the catcher boats again on July 17.

The catches of the two fleets were: Tenyo Maru--albacore tuna 740 tons; spearfishes 274 tons; yellowfin tuna 1,905 tons; bluefin tuna 220 tons; sharks 174 tons. Nojima Maru--yellowfin tuna 2,660 tons; big-eyed tuna 342 tons; albacore tuna 285 tons; spearfishes 266 tons; skipjack tuna and sharks 159 tons. Both fleets had attained about 50 percent of their catch goals. Towards the latter part of July they were expected to move south and fish for albacore tuna. (The Suisan Keizai, July 20, 1960.)

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SUMMER ALBACORE FISHERY FAILS TO LIVE UP TO EXPECTATIONS:

The 1960 summer albacore tuna season this year began amid predictions that a catch of 20,000 to 30,000 metric tons was certain, because ocean conditions were of the pattern found in years of good catches. The fishermen, therefore, hoped to make up this year for the poor catches of the past two years. However, due to two unexpected typhoons, the good fishing areas of the early part of the season failed, and the season ended badly late in June after a promising beginning. From the statistics assembled by mid-June, it was estimated that the total catch for this season will be approximately 20,000 tons, which is twice as much as last year and about 10 percent more than the year before last, but still less than the 25,000 to 30,000 tons of normal seasons.

This year the course of the warm Kuroshio Current was blocked off Shizuoka Prefecture by a cold-water mass, and the Kuroshio Current swung far out to the east, creating an unusually large outer boundary zone of low water temperatures as it moved northward. Consequently, there seemed to be a strong probability that albacore fishing grounds would be formed over a broad area extending from the coast out to distant waters, and right from the start the season was marked as one in which a big catch could be expected. Because of this fact, about 300 tuna boats assembled from all over the country at the ports of Yaizu and Shimizu, the size of the fleet far exceeding that of last year. Because of their poor catches of the past two years, the operators looked on this season as a crucial one, which would foretell the fate of the live-bait tuna fishery, and they were determined to make the most of it.

In mid-May, the fishery finally got under full swing. One boat after another brought its catch into Shimizu and Yaizu, and day after day tons of albacore were piled up in the markets of those ports. High boats brought in around 60 metric tons, the average was 10 to 15 tons, and the forecasts appeared to have hit the mark. At Yaizu, on May 30, landings reached 607 tons, breaking the previous record of 500 tons for the end of May set in 1957. However, although the total deliveries to the markets reached high levels, the catch per boat was unexpectedly poor. The majority of the boats brought in only 14 or 15 tons, and big catches were only about 30 tons. Top catches of about 56 tons were exceptional. A few years ago landings of 37 tons were nothing unusual.

Japan (Contd.):

There were probably various reasons for this, but there were three main ones: (1) The schools moved fast this year and responded poorly to the bait. (2) The Chilean tidal waves washed out bait stocks in many baiting areas and created a shortage of live bait. Fishermen tried using small mackerel as a substitute for sardines and anchovy, but it was unsuccessful. The poor response of the schools to bait is considered to have been due to the fact that the deep penetration of the cold Oyashio Current into the warm Kuroshio Current had created an abundance of food so that the fish were always full. (3) The presence of a large fleet on limited fishing grounds caused the boats to hold down each others catches by competition.

The result is that vessel owners are complaining that they are barely able to keep their heads above water financially. According to a survey at Yaizu, the boats belonging to that port made for the most part four trips and grossed only about 4-6 million yen (about US\$11,200 to \$16,800). It is said that trip expenses for a live-bait boat of the 100-ton class run around 800,000 yen (US\$2,240) and for a vessel of the 150-ton class they are 1 million yen (US\$2,800). Therefore, the income picture for this summer albacore season has been on the black ink side of the ledger, but it does not represent much as this is the fishermen's best opportunity for making money during the entire year. They feel that if they could land something over 10 million yen (US\$28,000) worth of albacore, that would be a different story.

In 1959 at Yaizu alone more than 10 boats gave up live-bait fishing and converted to long-lining, and the figure for the whole country was over 50 converted boats. One boat owner who has resolved to convert says that there is a strong probability that there will be others who will give up their traditional pole-and-line fishing. This trend also shows in vessel construction, with a clearly apparent move toward the building of purely long-line vessels. Last year in the Yaizu area there were 7 new long-liners built, two of them of 410 tons gross, but there was not a single live-bait boat built. The result has been that in the membership of the Yaizu tuna fishermen's cooperative association, the vessels are now evenly divided, 30 pure long-liners to 30 combination long liner-bait boats. If more boats are converted to long-liners, the past makeup of the fleet will be reversed.

At any rate, if the typhoons had come one month later, as in normal years, the fishermen would have expected to make as good a catch as in 1957. (The Suisan Keizai, June 30, 1960.)

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SKIPJACK TUNA PORT LANDINGS LIGHT:

Normally in July Yaizu, the leading skipjack port in Japan, would be bustling with the peak of the skipjack season, but it looks as if this year the skipjack have passed by Yaizu. June 1960 landings of all fishery products at Yaizu were 13,029 metric tons, worth 1,218 million yen (US\$3.4 million), 3,300 tons less than in June of last year. Landings of most tunas were above last year's, but skipjack, which make up the bulk of Yaizu's summer landings, were less than one-third of last year.

Last summer skipjack were unusually abundant, and in June landings were 10,000 tons, making up more than 60 percent of all

landings for that month. Every day there were landings of 300 to 400 tons, with a record one day of 890 tons of skipjack. This June skipjack landings were only 3,240 tons. Fishery operators are worried because daily landings have averaged only about 100 tons, and only a few days over 200 tons, and this on top of a mediocre summer albacore season. Ex-vessel prices are holding at a high level, with an average skipjack price for June 1960 of 88 yen a kilogram (US\$223 a short ton), just about double last year's price. (The Suisan Keizai, July 20, 1960.)

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SINGAPORE BASE FOR EXPORT OF TUNA TO U. S. PLANNED:

On July 14, 1960, the Japanese Export Tuna Freezers' Association expected to confer with responsible officials of the Japanese Fisheries Agency and the Ministry of Agriculture and Forestry on the question of establishing a base at Singapore. The main object of the base will be for transshipments, to facilitate exports to the United States. The project has been under examination for a long time. (The Suisan Keizai, July 10, 1960.)

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JAPANESE BUILD MORE TUNA VESSELS:

The Japanese Fisheries Agency on July 19, 1960, announced granting of construction permits for 28 new fishing vessels, including 8 tuna vessels. Gross tonnages of the tuna vessels were 387, 279, 308, 299, 309, 339, respectively, and two 99-ton. (The Suisan Tsushin, July 21, 1960.)

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CANNED SALMON PACK OUTLOOK FOR 1960:

The canned pack of pink salmon for export by canners of Hokkaido and northeastern Honshu, Japan, including land packs of the mother-ship companies, is expected to be somewhat more than 700,000 cases (full-case conversion 350,000 cases, probably 48 1-lb.-can cases). However, pink and chum packs on the North Pacific factoryships were reported in mid-July to be unexpectedly low, and there are strong indications that consignments to the Japanese Canned Salmon Joint Sales Company (which handles export sales) this year will be only about 1.35 to 1.4 million cases (last year they were about 2.31 million cases).

Japan (Contd.):

Factoryship pack of chums was expected at first to be about 270,000 cases (of which about 150,000 cases would be for the domestic market), but the price of fresh and salted chums has been extremely high and canned production has been given secondary consideration. Furthermore, the fact that the export price is lower than the domestic price has helped to hold the pack of chums for export to around 60,000 to 70,000 cases.

The fishing season for pinks was expected to be at its peak in mid-July, but the catch was unexpectedly poor. Around 250,000 to 300,000 cases (of which 50,000 cases will be for the domestic market) will be all that will be packed. If North Pacific mothership salmon fishing is continued right up to the end of the legal season, it is expected that production of silvers may be higher than last year, but even so informed sources believe that mothership packs of canned salmon for export may amount to only 1 million to 1,050,000 cases. (The Suisan Tsushin, July 20, 1960.)

HIGH PRICES FOR FROZEN SALMON RESTRICT MARKETING:

Japanese salmon dealers (there are about 120) in the Tokyo Central Market say that because of the drastic decline in salmon receipts and very high prices, fresh and frozen salmon has completely lost its marketability. There is a little fish coming into the market from the salmon mothership fleets. As of the end of June the price had not been settled between the mothership operators and the fishermen and, as a result, speculation kept the price so high that middlemen could not handle the fish. Prices for salmon from the eastern Hokkaido land-based fishery continue much higher than last year. (The Suisan Tsushin, June 28, 1960.)

MOTHERSHIPS PAY HIGHER PRICES FOR SALMON IN 1960:

The Japanese salmon mothership operators and the catcher boat operators came to an agreement on salmon prices for this season. Agreement was reached on July 19, the 70th day since the beginning of their negotiations. The agreement was for a 20-percent increase in prices. In addition, the mothership operators are to pay for each catcher

Species	1960		1959		1958	
	Y/Fish	US\$/Fish	Y/Fish	US\$/Fish	Y/Fish	US\$/Fish
Red . . .	396.00	110.0	330.00	91.7	300.00	53.3
Chum . .	165.60	46.0	138.00	38.3	125.00	34.7
Pink' . .	99.60	27.6	83.00	23.1	75.00	20.5
Silver and king . .	139.20	38.6	116.00	32.2	205.00	56.9

boat "cooperation money" in the amount of 120,000 yen (US\$333.50). (The Suisan Keizai, July 20, 1960.)

NORTH PACIFIC MOTHERSHIP SALMON FISHERY TRENDS, EARLY JULY 1960:

The Japanese North Pacific salmon mothership fleets, which had poor fishing early in the season because of stormy weather and a scarcity of pink salmon, as of early July 1960 got into the peak of their season. Catches picked up, and on the average the 12 fleets had taken about 70 percent of their catch quotas. It was considered almost certain that the motherships which were doing best would finish their quotas as early as July 25, with the slowest fleets making their full quotas and leaving the fishing grounds before August 10, the closing date set by the Soviet-Japanese fishery treaty.

Early in July the motherships Kizan, Kyoho, Shinano, Chiyu, Koyo, Miyajima, Jinyo, Eijin, Otsu, and Kyokuzan were fishing on grounds near Kamchatka, while Shoei and Kashima were fishing the more northerly grounds toward the Olyutorski area. In general, fishing was good for reds, chums, silvers, and chinook, and poor for pinks.

The fact that some vessels would end their fishing as much as 15 days ahead of the treaty closing date is due in part to the reduction of the total mothership catch quota from 100,000 metric tons in 1957 to about 54,000 tons this year, with each fleet's quota reduced proportionately.

The 33 salmon boats from the Ishinomaki area of northeastern Japan which were participating in mothership fleet operations in the North Pacific were expected to stop fishing early in August. According to reports to the Ishinomaki radio station, when they entered the Bering Sea fishing was poor and they had to move around a great deal in search of fish and were unable to fish long in any one area. Early in July they moved westward, following the red salmon, and almost all of the fleets reported good fishing.

Japan (Contd.):

Export cannery of the Ishinomaki district of northeastern Japan early in July had begun working on large shipments of North Pacific salmon, but it looks as if their production will be down from 20 to 40 percent, because of the cutback in the salmon catch resulting from the Soviet-Japanese fishery negotiations. Therefore, cannery in Ishinomaki and Onnagawa are saying that they cannot break even unless the Canned Salmon Joint Sales Company's price for export to the United States is 20 or 30 percent higher than last year. Last year's price for a case of 96 No. 3 cans containing 110 grams (about $3\frac{3}{4}$ ozs.) was 7,800 yen (US\$21.68), but this year they are hoping for 8,200 to 8,500 yen (US\$22.80-\$23.63). Also, since last year the female cannery workers of the Ishinomaki district have been covered under a minimum wage system and are getting at least 165 yen (US\$0.46) a day. (The Suisan Keizai, July 10, 1960.)

Note: Also see Commercial Fisheries Review, July 1960 p. 56.

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NORTH PACIFIC MOTHERSHIP SALMON FISHERY TRENDS AS OF JULY 25, 1960:

The Japanese North Pacific salmon mothership Koyo Maru (7,658 tons gross), which has been fishing in the Aleutian area, reported to the Hakodate office of its owners on July 24, 1960, that it had filled its catch quota of approximately 4,200 metric tons and ceased fishing operations. The mothership departed the fishing grounds on July 23 and was expected to reach Hakodate around July 30.

The number of days of fishing this year for the North Pacific salmon motherships was normal, but the catch quota allocations were cut back, and there were severe limits on areas of operation. Pink salmon fishing was poor, because of limitations on net mesh size, but red salmon fishing was reported to have been good. It looked as if the mothership fleets would complete their catch quotas and leave the fishing grounds before the end of July. As of July 10, it was reported that daily salmon catches were about 80 tons for each fleet. As of July 16, the 12 salmon mothership fleets had caught 44,262 metric tons of fish (3,698.5 metric tons average per fleet), leaving less than 10,000 tons to go in their catch quota of 54,000 tons. By species, the catch was (in tons): reds 17,168; chums 23,991; pinks 2,344; silvers 324; chinooks

435. (Suisan Tsushin, July 19, and Keizai Shimbun, July 25, 1960.)

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CANNERS EAGER TO BUY FROZEN ALASKA SALMON:

The drastic cut in the catch quota imposed by this year's Japan-Soviet fisheries conference and the scarcity of salmon this season in the waters on the Asian side of the North Pacific have resulted in the Japanese salmon packers being short of fish to keep their canneries busy and their foreign customers supplied. In an unprecedented move to make up this shortage, Japanese salmon packers are attempting to import frozen red salmon from Bristol Bay, Alaska, where the fish were expected to be considerably more abundant this season than they have been in the past several years.

The first public reports of such projects came on July 4, 1960, when the Tokyo fisheries trade press announced that one Japanese food company had been granted by the Ministry of International Trade and Industry a foreign exchange allocation of US\$2,420,000 for the purchase of 3,000 tons of frozen red salmon from the United States to be processed in a Hokkaido cannery into approximately 150,000 cases of canned salmon. On July 14, it was reported that the Japanese company's example had been followed by a large Japanese fishing company and a trading firm, which had filed applications for approval of imports of 1,000 tons and 1,500 tons, respectively, of frozen Alaskan red salmon. The trading firm reportedly expected to pay about US\$800 a ton c.i.f. for the salmon.

There is no indication that any of these would be importers have located a firm source of supply for the fish. With the fishing season in Bristol Bay almost over, there is little time for maneuvering, and the Japanese industry does not appear to be particularly hopeful about its chances of getting any considerable amount of Alaska red salmon to process this year. (United States Embassy, Tokyo, dispatch of July 14, 1960.)

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FISH SCRAP PRODUCTION ESTIMATED FOR 1960:

The Japanese Fisheries Agency estimates that the production of fish-press scrap in Japan for 1960, excluding mothership fish meal and whale meal, will total 113,500 metric tons.

Japan (Contd.):

The breakdown is as follows (in metric tons): body scrap--saury 38,400; sardine 5,000; sand lance 3,300; yellowtail 2,000; mackerel scad 6,000; larval anchovy 4,000; miscellaneous whole fish scrap 6,600; total whole fish scrap 65,300. Fish waste scrap, 41,900. Other fish scrap 6,300. Adding 45,000 tons of fish meal produced on factoryships and 24,000 tons of whale meal, it is estimated that the total Japanese production of fish scrap and meal this year will amount to 182,500 metric tons. (The Suisan Tsushin, July 12, 1960.)

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FISH-MEAL PRODUCTION IN BERING SEA OVER 25,000 TONS:

As of July 18, 1960, the four Japanese fish-meal factoryship fleets operating in the Bering Sea had made a total of 23,716 metric tons of fish meal. In addition, the Tenyo Maru had produced 1,863 tons, making a combined total of 25,579 tons of meal. Production by each fleet as of July 18 was:

Gyokuei Maru: 5,519 tons of meal, 1,215 tons of solubles, 120 tons of fish oil, 1,962 tons of frozen products.

Soyo Maru: 4,693 tons of meal, 1,505 tons of solubles, 166 tons of fish oil, 5,691 tons of frozen products.

Kinyo Maru: 6,812 tons of meal, 835 tons of solubles, 151 tons of fish oil, 63 tons of salt cod, 121 tons of frozen products.

Renshin Maru: 6,692 tons of meal, 1,768 tons of solubles, 125 tons of fish oil, 2,432 tons of frozen products.

In addition, the Tenyo Maru has made 1,863 tons of meal, 9.64 tons of liver oil, 300 tons of fish oil, and 1,752 tons of frozen products.

Since there are 14,013 tons of meal available in Japan, and in view of the market conditions and the high domestic demand, it appears that there will be no exports, and all of the meal will be consumed within Japan. (The Suisan Keizai, July 22, 1960.)

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DISTANT-WATER TRAWLING PLANS OF FIVE BIG FISHING COMPANIES:

The Japanese trawl fishery in distant waters is marking a new development in the Japanese fish-

ing industry. The five large Japanese fishing companies are pushing construction of large trawlers. During this year the first stage of their plans will be completed, and they will be sending trawlers of 1,500 tons, 1,800 tons, and 2,000 tons gross to catch bottom fish off New Zealand, Australia, and the east and west coasts of Africa.

Vessels capable of operating as of mid-July 1960 total 5. There are 7 big trawlers under construction. This means that before this year is over there will be 12 large trawlers heading for the African and New Zealand grounds. It is anticipated that they will land about 8,000 tons of red bottom fish (probably snappers) for the Japanese domestic market annually, and about 4,000 tons abroad. Among the various kinds of "snappers" which these vessels will land, not all are in high demand in foreign markets. In addition to about six species of snapper-like fish, the boats will catch tongue sole, gurnards, cuttlefish, groupers, croakers, and other bottom fish. Some are suitable for export and some are not, and this will have to be taken into consideration in planning operations exclusively for foreign markets. Fortunately, the demand for red bottom fish abroad is strong and promises to develop further in the future. However, snappers also enjoy a good demand in Japan, and it may be more profitable to sell them on the domestic market. At any rate, the Japanese Fisheries Agency, in its next year's budget requests for distant-water trawling is talking in terms of licensing 25 such vessels in the next fiscal year, and so this fishery is attracting much attention as the "wave of the future" of the Japanese fishing industry.

Of the five companies engaged in distant-water trawling, the first has the No. 62 Taiyo Maru and No. 63 Taiyo Maru (each of 1,570 tons gross) operating on the east and west coasts of Africa. The No. 62 Taiyo Maru began fishing June 4 and was scheduled to return to port September 15. The No. 63 Taiyo Maru began fishing June 22 and was expected to return to its base next year. This same company has two 1,870-gross-ton trawlers building in the company's Hayashikane Shipyard, the first of which was launched early in July. Both vessels were expected to be completed before the end of this year and are scheduled to sail to the African coast late in November.

The two 1,570-ton boats were scheduled to return to port after one trip, with about 1,800 tons of bottom fish. Depending on the demand for their catch in Japan, both of them may fish exclusively for the domestic market. For this reason they are not equipped with filleting machines. The two 1,870-ton vessels will fish for export, landing about 5,000 tons of fish a year in Greece and other European countries as fillets, fish-sticks, and in the round.

The second of the five companies has two trawlers, the Uji Maru and the Asama Maru, fishing off Argentina and landing their catches to that country. The company has a large trawler, the Tenjo Maru (2,250 tons gross) under construction. The sched-

Japan (Contd.):

ule called for her launching July 23, completion in September, and sailing for her maiden trip late in October. The Tenjo Maru, built at a cost of 530 million yen (US\$1,484,000), is the largest Japanese trawler--78 meters long (256 feet), with a beam of 13.5 meters (43 feet), a cruising speed of 14 knots from a 2,400-hp. Diesel engine, and a carrying capacity of 2,150 metric tons. Her maiden voyage was expected to be to the east coast of Africa. Operating plans call for two trips a year, with 100 days of fishing producing 1,500 metric tons of fish per trip for an annual total of 3,000 tons of "redfish" or snappers, all of which will be sold on the Japanese domestic market.

In view of the increasing demand in Argentina and in European countries for snapper species, some thought is being given to increasing the production of the Uji Maru and the Asama Maru.

The third of the five companies is building a 1,500-ton trawler at the Niigata Iron Works, which is slated for completion within the year. At first it was planned to build two such vessels, but the plan for the second has been changed to a 2,300-ton vessel, which will operate as a frozen whalemeat carrier in the Antarctic beginning next season. In the summer, the vessel will trawl off the African coasts. The 1,500-ton trawler will fish for export off New Zealand, and will export about 3,000 metric tons of fish annually to various European markets. The 2,300-ton vessel will fish off Africa, but will bring back slightly less than 3,000 tons of fish for the domestic market when it returns to Japan before the Antarctic whaling season.

The fourth of the five companies is building two 1,500-ton trawlers at Mitsubishi's Shimonoseki yards. One will be built this year and the second next year. Both vessels will fish off Africa, but the company is also thinking of using them for cod, halibut, and flounder in northern waters. The first vessel to be completed will be sent to Africa and its catch will all be exported to Europe.

The fifth company has chartered from a large Japanese fishing company the 1,000-gross-ton tuna long-liner Seiju Maru and is having her converted to a trawler at a Shimonoseki yard. The vessel was expected to sail from Tobata at the end of June 1960 to engage in trawling off northwestern Africa. Of the Seiju Maru's catch, 80 percent will be exported in the round to Europe and 20 percent will be filleted and shipped to the United States. The operators have been surveying the European market for red bottom fish (snappers), and have found acceptance very good.

This same company has been operating the trawler Tatsuta Marie off Northwest Africa. Her recent catches of "red fishes" or snappers were well received in Japan, showing that there is a high demand for this type fish.

A sixth company also is reported having plans to construct a 1,500-ton trawler in about a year.

(Suisan Keizai, July 17, July 12, and June 25, 1960.)

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OYSTER-FREEZING PLANT BUILT WITH U. S. TECHNICAL AID COMPLETED:

On June 6, 1960, a large Japanese fishing company held ceremonies marking completion of the first plant in Japan designed for production of fresh-frozen oysters for export. The Hiroshima plant was planned and equipped under a technical agreement with a United States firm. Thus it will be possible for the first time to export to the United States raw Hiroshima oysters, which up to now have been sold mostly in the Japanese market. In addition to the frozen raw oysters, the Hiroshima plant will develop into a general food processing factory with canning and sausage-making departments.

The three main points about the freezing installations that have resulted from the technical partnership with the United States company are:

(1) Freon is used as a refrigerant in industrial quick-freezing for the first time. Generally in Japan for large-scale quick-freezing, ammonia is used as the refrigerating agent.

(2) By using unit coolers, the air-blast system is employed throughout for freezing and cold storage. Temperatures in the freezing rooms can be brought as low as -30° F., and the oysters are frozen while still loaded on special transporting buggies. The unit coolers and all the other latest types of machinery, such as water coolers, the air conditioning, and the all-automatic ice machine, can be controlled and operated from a central control panel.

(3) Shucking of the oysters is done on a new type of installation. For the first time in Japan oysters will be shucked with knives on installations called "bunkers." The shucking tables and the floors are all of terrazzo, and the concrete that is used is of a type that will not crack and produce crevices in which germs can grow. Containers for the oysters are of stainless steel, washing is done with chlorinated water, and sterilization is complete, so that every effort has been expended on hygienic details.

The main parts of the plant are the oyster-processing plant, the refrigeration plant, the cannery, the ice plant, the boiler room, the sanitation control room, and the offices. The total area is about 9,496 square yards. The plant is able to (1) freeze 36 tons a day of oysters or shrimp, (2) store 600 tons of frozen products, (3) make 20 tons of ice a day, (4) can 2,000 cases per day, and (5) make 20,000 sausages a day. (Suisankei, June 1960.)

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AUSTRALIAN RED SNAPPERS ON TOKYO MARKET FOR FIRST TIME:

The Tokyo fish market received on July 20, 1960, about two carloads of tropical red snappers, the first such shipment this year. The fish were caught off Australia by the 500-gross-ton trawler Shinano Maru. Up to now such fish have been marketed mostly in western Japan, but the dealers expect to develop a considerable market for them in Tokyo. Another trawler from the Australian grounds, the Ikoma Maru, was expected to return in August. (The Suisan Keizai, July 20, 1960.)

Kuwait

DEVELOPMENT OF OFFSHORE FISHERIES UNDER CONSIDERATION:

Within the past year there have been several developments in the fishing industry of Kuwait. The most important one seems to have been that certain Kuwaiti merchants and shaykhs have been able to convince the Ruler of Kuwait that modern commercial fishing in the Persian Gulf will not be detrimental to the native fishermen and the Ruler has granted the merchants permission to engage in modern commercial fishing.

In the fall of 1959 a New York City firm sold fishing boats to a Kuwaiti merchant and supplied him with United States captains and crews. The Kuwaiti immediately embarked on an ambitious shrimp-fishing enterprise. Shrimp are caught, cleaned, and frozen on board the trawlers and then are delivered to freight ships for delivery to the New York City partner of the Kuwaiti for sale in the United States. This arrangement has proved profitable in the one-half season of operation. The fish, which are caught incidental to the shrimp operation, are sold on the local market at prevailing prices. There has been no corresponding reduction in price as a result of this activity as the Ruler himself has specified that native fishermen are not to be undersold. However, Kuwaiti citizens have benefited by a selection of fish generally larger than previously and by more regular supplies.

Another potentially important development has been the interest of one of the major Kuwaiti shaykhs in organizing a large Kuwaiti fishing fleet designed to operate not only in Kuwait waters but throughout the Persian Gulf. The shaykh's interest seems to have been inspired by a young Sudanese entrepreneur, who has been sent by the shaykh to investigate fishing opportunities throughout the Gulf. The Sudanese has just presented a report to the shaykh on his findings.

After reviewing the primitiveness of present-day fishing and the relatively small catches, the Sudanese points out that fishing nevertheless is quite profitable in the Gulf. Indeed, fishermen along the West coast of the Persian Gulf and the Gulf of Omah are able to export some quantities of dried fish. His conclusion is that scientific fishing in the Gulf, using local labor, could yield large quantities of fish and be capable of supplying a substantial export market.

The Sudanese in his report proposes setting up a fishing company in Kuwait which would own a fleet of trawlers and also buy the catch of local fishermen. The fish would be cleaned, frozen, and exported to other Arab countries or to Europe or the United States via merchant ships or by trading trucks operating between Kuwait and the states of eastern Mediterranean. He proposes furthermore building a fish cannery in Kuwait, a fish meal plant to use industrial fish and waste products from the fish processing. He also would build a plant for smoking fish and one for extracting oil from sar-

dines and shark livers. The Kuwaiti Shaykh and his Sudanese partner do not intend to operate the fleet themselves, but wish to enter into partnership with a foreign firm which would organize and operate the fishing fleet, build and operate the factories, and use its connections to dispose of the products. The Kuwaiti would probably do little more than supply the capital.

The shaykh also wishes to bring a professional ichthyologist to the Persian Gulf to conduct a scientific survey of the quantities and types of fish available and the size of the maximum sustained catch which would not deplete the fish supply. It is hoped that a United States firm or educational institution will be able to conduct this survey. It would benefit not only Kuwait, but all the riparian states.

An article in a Kuwait magazine claims that there are about 400 kinds of fish found in the Persian Gulf. It lists the primary edible fish as follows: zubaidi, sheem, nuwaibi, nagrou, biah, meed, sabiti, hamour, sha'am, hamman, shimahi, tabaglagaz, shabamba'a, sabour, and khafaf. It also lists a number of fish which are found in the Gulf but which cannot be eaten, as well as a number of poisonous or harmful fish. The article states that one important aspect of Persian Gulf fish is the fact that there are very few brightly colored types. Most are light or dark gray, white, silver, light blue, or light red, whereas fish of the Red Sea and the southern Arabian peninsula are brightly colored.

In the section on present day fishing in Kuwait the article states that most fish are caught in the spring and the summer. It also says that the best fishing is "between the 11th and 18th of every lunar month, i.e. when the tides are strongest." The nets then are anchored and the tide sweeps the fish into them. (United States Consul in Kuwait, July 14, 1960.)

Note: Also see Commercial Fisheries Review, August 1960, p. 61.

Liberia

REGULATIONS ISSUED FOR MARINE AND INLAND FISHERIES:

The Liberian Department of Agriculture and Commerce has published the first detailed maritime and inland fishing regulations to go into effect in Liberia. These regulations follow:

(1) Establish mandatory license fees for commercial fishing vessels ranging from \$150 for trawlers to \$5 for native canoes, but exempt subsistence fishermen and persons under sixteen "who are not required to have license to fish."

Liberia (Contd.):

- (2) Authorizes the Bureau of Fisheries to prohibit fishing gear harmful to fishery resources and particularly prohibits dynamiting.
- (3) Authorizes the Bureau of Fisheries to close any fishing zone because of overfishing resulting from use of certain types of fishing gear.
- (4) Establishes mesh regulations.
- (5) Requires monthly reports from commercial fisheries, with respect to area of catch, tonnage, gear used, value of catch, and species of fish caught.

Although enforcement may prove to be a problem, these regulations represent a useful first step toward better management of Liberia's fisheries resources. They should also be helpful in developing, over a period of time, more accurate information on the extensive, but inaccurately charted coastal fisheries resources of the country. (U. S. Embassy in Monrovia, June 26, 1960.)



Malaya

TUNA VESSELS ASSIGNED TO MALAYA:

The Japanese Overseas Fisheries Company signed contracts for two 100-ton tuna vessels from Kochi Prefecture to proceed to Penang, Malaya, the latter part of July 1960. Negotiations were being carried on for another two vessels, which were scheduled to sail in August. The company already has under charter one vessel, which is being used jointly with a Ceylonese company. (The Suisan Tsushin, July 8, 1960.)



Mexico

CARMEN-CAMPECHE AREA SHRIMP
LANDINGS AND EXPORTS,
OCTOBER-DECEMBER 1959
AND JANUARY-MARCH 1960:

Total landings (estimated from all available sources) of shrimp at Mexico's Gulf Coast ports of Campeche and Carmen in the fourth quarter of 1959 were about 2,535 short tons. About 1,750 tons were landed at Car-

men and 785 tons at Campeche. Estimated percentages by species were 57 percent pink, 8 percent brown, and 35 percent white in the Carmen area and 84 percent pink, 5 percent brown, and 11 percent white in the Campeche area.

Total landings of shrimp at those two ports in the first quarter of 1960 were about 1,479 short tons of which 1,071 tons were landed at Carmen and 408 tons at Campeche. Estimated percentages by species were 42 percent pink, 13 percent brown, and 45 percent white at Carmen and 80 percent pink, 6 percent brown, and 14 percent white at Campeche.

A small portion of the Campeche-Carmen area landings is marketed domestically and is made up principally of culls and small shrimp. No figures by size or species are available because it is not possible to determine the disposition made of the quantities consumed locally or included in domestic shipments. It is generally estimated that the domestic consumption does not exceed 10 percent of the tonnage landed.

During the last quarter of 1959, a total of 2,191.7 short tons (statistics from the Fishing Office--Oficina de Pesca) were shipped to the United States--1,644.3 tons from Carmen and 547.4 tons from Campeche.

During the first quarter of 1960, a total of 1,344.9 short tons of frozen shrimp were shipped to the United States--973.8 tons from Carmen and 371.1 tons from Campeche. Except for a few hundred pounds, all exports go to the United States.

Other fishery products exported from the Carmen-Campeche area to the United States during the last quarter of 1959 included 206,000 pounds of frozen fish, 2,293 pounds of shark fins, and 9,731 pounds of shark skins. During the January-March 1960 quarter other exports included 192,986 pounds of frozen fish, 3,395 pounds of shark fins, and 14,204 pounds of shark skins. (United States Consulate, Merida, June 22, 1960.)

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SHRIMP INDUSTRY TRENDS,
JUNE 1960:

What in late May looked like the beginning of an early rainy season fizzled out. As a result, prospects for another record year for Mexico's west coast shrimp fishery are less promising.

Mexico (Contd.):

The trend towards peeling and deveining of shrimp in the Gulf of Mexico in the Carmen-Campeche area is on the increase. Reports from various industry sources indicate that current shrimp exports from that area are about 80 percent or more peeled and deveined.

The Carmen-Campeche "price war" over independent boats continued into July, although the only increase between May 19 and July 5 was in the price of white shrimp which was increased one cent a pound across the board. To discourage landings of small shrimp, prices on 66-and-over count shrimp were dropped from 26 to 18 cents a pound. No changes in Salina Cruz (west coast) ex-vessel prices were reported recently.

Ex-vessel prices in U. S. cents a pound for independent vessels at Carmen and Campeche for white shrimp as of July 5 were as follows: under 15 count, 81; 15-20 count, 76; 21-25 count, 71; 26-30 count, 66; 31-35 count, 59; 36-40 count, 49; 41-50 count, 44; 51-65 count, 37; and over 65 count, 18. Ex-vessel prices for pink and brown shrimp were one cent a pound under the white shrimp price except for the over-65 count which was also 18 cents.

As expected at this time of year, landings at Salina Cruz on Mexico's west coast dropped off somewhat. Vessels were reported landing one to two tows per trip of 12 to 14 days. Landings at Carmen and Campeche picked up during June with vessels averaging around 1,300 to 1,500 pounds per trip in each place. At Carmen during the first half of the month, landings were mostly pinks and browns, but during the last half whites predominated, followed by pinks and a few browns. At Campeche landings averaged about 80 percent pinks during June. During the first half of June the remainder was about equally divided between whites and browns, but during the last half whites accounted for about 20 percent with only a scattering of browns.

Sizes at Carmen were fairly uniform throughout the month, averaging about 35 percent 30 count and under. Sizes at Campeche tended to decrease as the month progressed. During the first week landings were running around 75 percent 30 count and under and during the last week about 60 percent of the landings were of those sizes. (United States Embassy, Mexico, report of July 7, 1960.)

THIRD SHRIMP-BREEDING PLANT ESTABLISHED:

The third shrimp-breeding plant for Mexico was scheduled to start operating in the Pacific Coast port of Salina Cruz, Oaxaca, about mid-June 1960. But a July 5 report indicates that although all equipment has been installed, the plant was still operating only on a trial basis and training workers. It is reported that the plant will have a capacity of about 5,000 pounds of breaded shrimp (finished product) per 8-hour shift. In addition to breeding, the plant will produce individual-frozen peeled and deveined raw shrimp.

When the plant is in full operation, Mexico's daily capacity for producing breaded shrimp in all three plants, will be about 15,000 pounds in 8 hours. Of the three plants one is located in Puerto Mexico, Veracruz, and two in Salina Cruz., according to a June 3, 1960, dispatch from the United States Embassy in Mexico City.

ENSENADA FISHERIES TRENDS, APRIL-JUNE 1960:

During the second quarter of 1960 landings of fish and shellfish in the Ensenada area of Mexico's west coast were down and many cannery workers were unemployed. Early reports from the abalone fishery indicated catches lower than anticipated, but with several months remaining in the abalone fishing season, catches could pick up.

There have been discussions between various groups of fishermen and a Federal Deputy concerning the failure of fishing cooperatives and alleged exploitation of fishermen. The Deputy promised to ask the Mexican Chamber of Deputies to study the possibilities of returning to free fishing, according to a June 23, 1960, report from the United States Consulate in Tijuana.

FISH MEAL AND OIL INDUSTRY:

Mexico has 15 fish-meal plants and one plant producing solubles. Of the meal plants only two are in more or less constant operation. The remaining plants are either shut down or are connected with canneries and only operate when fish and fish waste are available. Only four plants can be considered to have modern equipment. One of these produces only solubles and liquid fish. Another, designed for producing fish flour by the azetropic process, has never been operated. One of the modern meal plants, located in Ciudad del Carmen, has a capacity of 10 tons of raw fish an hour and the other, in San Blas, Nayarit, can handle but one ton.

Mexico (Contd.):

The other plants have old secondhand machinery, mostly purchased from plants in California, and practically all use direct-flame dryers. In this group only one plant is known to have centrifuges for separating the oil. The others use settling tanks.

If all plants were in operation, the total capacity would be 110 to 115 tons of raw fish an hour or about 180 tons of meal per 8-hour day, providing fish were available.

No new plants are being planned at this time. The present world price of meal is a decided deterrent.

The Mexican plants produced an estimated 2,000 to 3,000 metric tons of meal in 1959. The 1960 production should be considerably higher since the Carmen plant is now producing around 600 tons a month. In addition to the meal produced by the plants, there are 1,200 to 1,500 tons produced by sun-drying trash fish and scrap. Along the West Coast the fish are boiled and then laid out on the ground in the sun to dry. In Yucatan the scrap from a filtering plant is sun-dried without previous cooking. The dried fish are then pulverized in small hammer mills to make the meal.

The quality of the Mexican meal, as can be expected from the varying sources of supply and processing techniques, varies considerably. The meal sources for the Baja California plants come mostly from waste from California sardines and Pacific and jack mackerel with some waste from tuna and yellowtail. The West Coast sun-driers use 50 or more different species of fishes taken by shrimp trawlers and by weir fishermen. The San Blas plant uses trash fish caught with shrimp trawls and it also processes sharks and turtles. This is the only plant in Mexico that introduces solubles from concentrated stickwater into the meal. The Carmen plant uses mostly anchoveta (*Cetengraulis edentulus*), but some menhaden and other fish are also processed.

The sun-dried meal is the poorest quality because the protein content usually runs between 40 and 50 percent.

Table 1 - Analyses of Three Samples of Plant-Produced Fish Meal

Product	Sample 1	Sample 2	Sample 3
	(Percent)		
Moisture	8.80	8.3	9.72
Protein	63.50	66.6	62.53
Fiber	0.96	0.3	-
Ash	14.90	22.1	-
Fats	9.06	8.4	9.80
Nitrogen free extract	2.78	-	-
Chlorine	-	-	1.59
Nitrogen	-	-	10.02

From various reports, oil recovery runs between 2 and 8 percent. The average is probably around 3.5 to 4.0 percent. Mexican fish oil is all used locally. Most of it is used in the paint and tanning industries. The oil from the trawl-caught trash fish is reported to be quite high in stearins.

Generally the producers sell their oil at a fixed price and do not concern themselves with any analysis. One sample of Mexican fish oil was reported to have the following characteristics: pounds per gallon, 7.71; specific gravity, 0.925; color—Gardner 1933, No. 10; iodine number, 160; acid number, 1.59; and refraction index, 1.481.

Only two plants produce fish solubles in Mexico. The meal plant at San Blas concentrates the stickwater to about

40-percent solids and then adds it to the meal in the dryer. The production of this plant is quite small since it can handle only one ton of raw fish per hour.

In Ensenada one plant is dedicated solely to the production of fish solubles. Its capacity is reported to be about 5,000 gallons of 50-percent solubles per day. The plant has modern three-phase equipment for producing solubles. In addition this plant has two retorts capable of liquifying about 5 tons of fish waste per day. No additional enzymes are needed for liquifying the fish. The liquified fish are mixed with stickwater and processed to produce 50-percent solubles. The entire production of solubles is exported to California.

The millers who buy sun-dried fish usually pay 1.00 peso (8 U.S. cents) per kilo of dried fish, which after milling and bagging or sacking they sell for 1.50 pesos (12 U.S. cents) a kilo. Paper bags holding 25 kilos of meal cost 65 centavos (US\$0.052) and cloth sacks holding 50 kilos cost 2.80 pesos (US\$0.224) each.

Around Ensenada, most canneries own their own boats and reduction plants and the waste from the canneries is processed for meal and oil as a byproduct of canning. One company figured that sardines and mackerels caught by company-owned boats cost US\$40 per metric ton. It was reported that independent boats were receiving 400 pesos (US\$32) per metric ton of sardines and mackerel. If the fish are unsuited for canning, only 65 percent of this price is paid.

The plant at Carmen pays 200 pesos (US\$15) per metric ton of fish. This plant estimates its cost for meal, delivered in Mexico City, to be about 2,200 pesos (\$176) per metric ton.

The boats at San Blas, Nayarit, are company-owned and no separate accounting is kept of fish cost.

The Mexican Government, as an aid to feed producers, has restricted the importation of manufactured feeds. This has resulted in a considerable increase in the demand for fish meal by the feed producers. This restriction caused an upsurge of interest in fish-meal plants which quickly died out owing to the low price of Peruvian meal. On July 8, 1960, Peruvian meal was being offered in Mexico City at 1,637.50 pesos (US\$131) per metric ton. All Mexican meal producers are complaining of their inability to compete at those prices.

The Ensenada meal producers, who normally sell most of their product in the United States, are unable to compete with Peruvian prices either in the United States or Mexico. Freight and handling charges from Ensenada to the feed-producing plants are reported to be between US\$25.00 and \$30.00 per metric ton.

Import permits are not required on fish meal, but agricultural sanitary permits are. Import duties amount to US\$19.776 per metric ton.

In the production of meal, the Government as a severance tax charges 40 pesos (\$3.20) per metric ton of fish.

Import permits are required for fish oils. Import duties vary with the size of the container.

In containers weighing 50 kilos or less, the duty is 25 centavos per gross kilo plus 20 percent ad valorem. The official price for determining the ad valorem duty is 8.80 pesos per gross kilo.

In containers larger than 50 kilos, the specific duty is 25 centavos per gross kilo and the ad valorem is 7 percent. The official price is 6.30 pesos per gross kilo.

In tankers or tank cars, the specific duty is 20 centavos per net kilo and the ad valorem is 18 percent based on an official price of 5 pesos per net kilo.

In addition there is a port tax of 3 percent of the value of the import duties.

Mexico (Contd.):

Other than import duties and restriction on the importation of manufactured feeds, the Government has given no assistance to fish-meal producers. Something may be done in the near future because of the complaints of the local fish meal producers.

The Carmen plant does not now save the stickwater but plans have been made to install a concentration plant so that the condensed solubles can be added to the meal.

An organization in Mazatlan is consulting with an English concern in an endeavor towards developing equipment that will permit partial processing of trash fish aboard shrimp trawlers. If such equipment can be developed satisfactorily, the shrimp fleet should be able to supply most of Mexico's fish-meal needs.

Under present world prices for fish meal, it is highly improbable that there will be any expansion in fish-meal production in Mexico in the immediate future unless the Government does something to assist the local industry.

When and if the price situation becomes rectified, it is probable that Mexico eventually will become self-sufficient with respect to both meal and oil. This day, however, is not in the immediate future. It seems very likely that some technique will be developed before long which will permit partial processing aboard shrimp boats. When this day arrives, Mexico can become self-sufficient and perhaps even enter the export market. Until then it is not likely that Mexico will be in a position to supply her own demands. (United States Embassy, Mexico, report of July 18, 1960.)



Netherlands

ANTARCTIC WHALE CATCH,
1959/60 SEASON:

The Netherlands Minister of Agriculture reported on July 6, 1960, that the Netherlands Antarctic whaling expedition caught slightly less than 6.7 percent of the total blue-whale units taken during the 1959/60 pelagic whaling season. The Netherlands catch in the 1959/60 season was 1,037 out of the 15,512 blue-whale units taken by all nations. In the 1958/59 season, the catch was 965 out of the total of 14,300 units, or slightly over 6.7 percent. The Minister reported that the Netherlands whaling expedition operated during 1959/60 season for 121 days, as compared to 102 days fixed by the International Whaling Convention for member countries. The Netherlands and Norway were not parties to the Convention in 1959/60. (United States Embassy in The Hague, July 12, 1960.)



New Hebrides

JAPANESE BASE TO EXPORT
FROZEN TUNA TO FRANCE:

The Japanese trading company operating the tuna base in the New Hebrides in July

1960, recently applied to the Japanese Fisheries Agency to increase from 8 to 12 the number of tuna boats based at Espiritu Santo. That base has been exporting to the United States about 3,500 tons of frozen tuna a year, and this year for the first time the French Government granted the right to export annually 1,000 tons of tuna (or tuna products) to France. (The New Hebrides is a British-French joint dominion, and the French Government has in the past prohibited the import of tuna from other than French territories.)

Since there is little probability that the 8 boats operating out of the base could fill the quota for export to France, the application for an increase in the fleet was made. If the increase is granted and the 1,000-ton quota is filled this year, it is considered possible that the quota may be increased in the near future. Already this year about 300 tons of tuna from the Espiritu Santo base has been shipped to France, where the price is the same as in Italy. (The Suisan Tsushin, July 21, 1960.)



New Zealand

EXPORTS OF FISH-LIVER AND
WHALE OIL, 1959:

In 1959, New Zealand exported 272,655 Imperial gallons of marine-animal oils--97.2 percent whale oil and 2.8 percent fish-liver oils. The fish-liver oil exports accounted for 41 percent of the total value, however, due to their relatively higher value--US\$16.03 per

Type and Destination	Quantity		Value	
	Imperial Gallons	LNZ	US\$	
Fish Liver Oil, ^{1/}				
United Kingdom . . .	4,602	33,494	93,887	
Australia	3,161	10,888	30,520	
Total	7,763	44,382	124,407	
Whale Oil:				
Australia	39,345	11,393	31,936	
Italy	57,697	12,936	36,261	
Netherlands	167,850	39,613	111,039	
Total	264,892	63,942	179,236	
Grand Total	272,655	108,324	303,643	

^{1/}In containers of 1 gallon or over.
Note: Values computed at rate of one New Zealand pound equals US\$2.8031.

Imperial gallon as compared with US\$0.68 a gallon for whale oil. (U. S. Foreign Agricultural Service Report, Wellington, April 22, 1960.)

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New Zealand (Contd.):

SWEDES ESTABLISH FACTORY FOR SPORT FISHING EQUIPMENT:

Negotiations between a Swedish manufacturer of sport-fishing equipment and a representative of a New Zealand firm for a jointly-owned factory in New Zealand have been completed, according to press reports from Sweden.

The Swedish company will establish a factory at Rotoura on the northern island of New Zealand for the manufacture of fishing rods, trolling spoons, and other sport fishing equipment. (U. S. Consul in Goteborg, Sweden, June 23, 1960.)



Peru

FISH-MEAL INDUSTRY SEEKS TO LIMIT PRODUCTION AND EXPORTS:

A deepening crisis in the Peruvian fish-meal industry, due to overproduction, declining world demand, and prices which have fallen to a point generally considered to be below the cost of production in most if not all instances, has caused Peruvian fish-meal producers to try to find a mutually acceptable course of unified action to meet the present critical situation. Some elements of the industry have expressed doubt that these efforts will be successful, and it has been suggested that the Peruvian Government may have to take action to curtail fish-meal production if the industry is unable to do so. Other elements believe that the industry will tend to be somewhat chaotic for the next year, during which a substantial percentage of existing plants will be forced to close or to change ownership, but that eventually, through the operation of economic factors, the situation will normalize and that, as a result, Peru will have a less spectacular but a sounder and stronger industry.

The Sociedad Nacional de Pesquería (The National Fisheries Society), the trade association of the Peruvian fishery industry, has been endeavoring to help the fish-meal industry achieve stability through its sponsorship of efforts to counteract the present situation of overproduction and plummeting prices. Representatives of the Society have expressed the belief that the industry can achieve stability by fixing maximum production at 400,000 to 450,000 metric tons, a production quota which probably would give the Peruvian industry a fair and equitable share of the world market, and would permit prices to recover sufficiently to give producers a reasonable profit.

Under the auspices of the Society, meetings of representatives of the Peruvian fish-meal industry were held June 23 and June 30, 1960. The purpose of the meetings was twofold: To consider reports of committees which had been asked to recommend measures for limiting production and exports as a means of bringing stability to the Peruvian industry, and to consider a proposal that the Government of Peru be asked to suspend the issuance of licenses for new fish-meal plants while the problem of overproduction in Peru continues. (In that connection, it has been reported that the Ministry of Agriculture, Bureau of Fisheries and Hunting, has been withholding licenses for 12 new fish-meal plants.) The proposals were rejected by the large majority of those attending on the

ground that they were contrary to Peru's traditional policy of freedom of commerce and industry.

The proposal advanced for consideration at the first meeting was that the 74 existing fish-meal plants should be assigned production quotas. That assigned to each plant appears to have been its fullest possible production capacity. The total of the fixed quotas for the 74 plants was 1,021,400 tons. Plants in a second group, consisting of new plants without production history for 1959 or the first 4 months of 1960, including those under construction, were to be limited to 40 percent of their authorized capacity, as specified in their licenses. The proposal did not come to a vote because of the strong opposition voiced at the meeting. The proposal offered at the second meeting is understood to have involved the establishment of four categories of plants according to size, with the objective that the production capacity of each group would be reduced by a specified percentage agreeable to the plants in each group. It also proved to be unacceptable.

A new committee, whose members consist of representatives of large producers, of small producers, and of new plants which have received licenses to operate but which have not yet entered into production, has been asked to seek new means of coordinated action acceptable to the several groups involved. Among suggestions for measures to be considered are the establishment of closed seasons for anchovy fishing, which would automatically reduce production, and a request to the Government for exemption of the fish-meal industry from duties and taxes in order to reduce costs below the world price.

Following the first meeting, data appeared in the press which pointed up the seriousness of the existing problem of overproduction in the Peruvian fish-meal industry. World consumption of fish-meal was estimated at 875,000 tons, whereas the export potential of world-producing countries (including Peru at 400,000 tons) was estimated at 1,070,000 tons, or nearly 200,000 more than world consumption. Moreover, Peru must not only compete on the bases of price and quality with other producing countries, including Chile, for the available markets, but it must meet European buyer resistance to offers of \$60 per ton, increased freight rates from Peruvian ports to Europe, and the threat of restrictions in United States, British, and other markets whose domestic producers are seeking limitations on imports of fish-meal from Peru. An especially serious consequence of the present situation was stated to be the substantial reduction in revenues to the Government from taxes on fish-meal exports, an important source of income during recent years for the national budget.

The only official statistics for fish meal yet available for 1960 are those for exports during the first quarter of the year. They show a total of 148,091 tons for the first three months, or a monthly average of about 49,000 tons. Other data based upon shipping manifests show total shipments for January through May of approximately 250,000 tons, or a monthly average exceeding 51,000 tons. It is of interest to note that more than 72 percent of the shipments for the five-month period went to countries in Europe, principally the Netherlands and Germany; 10 percent went to the United States. Projecting exports for the full year at the same rate, the 1960 export total would be about 612,000 tons, compared with 277,600 tons exported in 1959 and 105,777 tons exported in 1958. Production in the latter year, the latest for which actual production data are available, amounted to 126,900 tons. Considering that between 80 and 85 percent of Peru's fish-meal production has been exported, total production in 1958 may be estimated at about 335,000 tons, and that for 1960 (at January-May level of production) at about 725,000 tons.

It has been suggested that Peru's fish-meal production in 1960 could exceed a million tons, because of the number of new plants coming into production and the expansion of existing plant and fishing facilities. However, some industry experts believe that a more realistic production figure for the current year would be about half that amount. They cite the

Peru (Contd.):

strike of anchovy fishermen in April and May, the seasonally lighter supply of anchovy for six months beginning in May, and above all the world price situation, as limiting factors for Peru's over-all fish-meal production in the current year. Since present world prices are below cost of production in Peru, it is considered likely that some plants may close for the time being. Those with sufficient financial backing can afford to wait out the crisis. Others may find themselves in stringent circumstances and be forced to remain closed permanently.

The consensus at present is that no solution of Peru's problem of overproduction through concerted action of Peruvian producers is in sight, due to the natural reluctance of producers or prospective producers to agree to curtail their output. The large established producers who understand the seriousness of the situation probably could find a mutually agreeable basis for limiting production in the circumstances. Newcomers to the industry, not appreciating the world situation and the menace to the entire Peruvian industry, including themselves, are concerned only with prompt returns on investments. In the end, some agreement on a production quota may be reached, but it probably would be a series of compromises without real value.

Some representatives of the industry have suggested that the world can use much more fish meal than it is willing to buy at present, and that the eventual solution of Peru's problem will come through wider use of the product. They believe such a trend could develop—possibly beginning in four months or so—when all fish meal sold under forward contracts at high prices has been absorbed, and all buyers have had the advantage of the moderate-priced product. They be-

lieve Peru can produce about half a million tons of fish meal a year and that the industry itself, emerging from the present crisis as a stronger and better developed segment of Peru's economy, will maintain that rate of production, according to the report dated July 7, 1960, from the United States Embassy in Lima.



Portugal

CANNED FISH INDUSTRY, 1959:

In 1959, Portugal exported 76,986 metric tons of canned fish, valued at 1,142 million escudos (US\$39.7 million) as compared with 68,102 tons in 1958, valued at 1,035 million escudos (US\$35.9 million). Exports in 1959 were at a record high and were substantially higher than in 1958, another record year. The United States, one of Portugal's leading customers, purchased some 7,340 tons, valued at nearly US\$5 million, but not including a small amount shipped to United States Territories.

Considerable competition among Portuguese exporters resulted in lower export prices in 1959, despite higher production

Table 1 - Portugal's Exports of Canned Fish by Type, and Country of Destination, 1959/1

Country	Sardines		Tuna		Anchovies		Mackerel		Other Fish		Total Canned Fish	
	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000	Metric Tons	US\$ 1,000
United States	3,368	2,444	1,027	728	2,707	1,951	40	20	198	124	7,340	4,967
United States Territories	51	24	-	-	-	-	-	-	60	42	111	66
Africa, British East	354	159	4	3	19	13	4	3	-	-	381	178
Africa, British West	1,380	619	-	-	3	2	-	-	152	55	1,535	676
Africa, French Eq.	351	160	-	-	1	1	-	-	28	11	380	172
Algiers	156	71	-	-	50	35	-	-	44	17	250	123
Australia	264	121	6	4	70	48	-	-	18	6	358	179
Austria	2,269	1,069	-	-	117	82	37	18	85	32	2,508	1,201
Belgian Congo	798	363	21	16	10	7	51	25	406	150	1,286	561
Belgium-Luxembourg	3,905	1,843	103	73	90	63	913	464	15	6	5,026	2,449
Canada	295	165	6	4	183	127	32	17	5	1	521	314
Cyprus	130	60	-	-	18	12	2	1	161	41	311	114
Czechoslovakia	106	49	-	-	-	-	12	7	-	-	118	56
Denmark	338	153	-	-	2	2	-	-	2	1	342	156
France	3,167	1,446	18	13	1,040	702	213	106	135	55	4,573	2,322
Germany	16,601	8,314	15	11	208	145	72	36	3	1	16,899	8,507
Ghana	2,313	1,075	-	-	2	1	-	-	-	-	2,315	1,076
Greece	993	478	-	-	74	50	27	N.A.	1,168	232	2,262	760
Holland	1,113	529	-	-	5	4	5	2	16	4	1,140	540
Italy	4,443	2,386	2,241	1,572	995	887	1,562	783	958	377	10,199	6,005
Jordan	215	98	-	-	2	2	1	2	107	37	325	137
Kuwait	110	50	-	-	2	2	-	-	-	-	114	52
Lebanon	659	305	-	-	15	11	17	9	39	13	730	338
Liberia	69	32	-	-	-	-	-	-	70	25	139	57
Mexico	767	353	16	11	10	7	-	-	13	9	806	380
Overseas Portuguese Provinces	393	446	27	19	10	8	-	-	57	29	1,087	502
Philippines	2,049	894	-	-	2	1	-	-	360	312	2,411	1,207
Poland	517	239	-	-	23	17	-	-	-	-	540	256
Syria	388	180	-	-	3	2	-	-	158	58	549	240
Sweden	931	408	-	-	8	6	15	7	2	1	956	422
Switzerland	1,320	700	72	50	253	178	172	89	14	2	1,831	1,019
Togoland & Fr. Cameroons	353	157	-	-	-	-	-	-	-	-	353	157
Union of South Africa	114	53	10	7	54	37	2	1	-	-	180	98
United Kingdom	7,492	3,448	7	5	179	125	5	3	5	1	7,688	3,582
Venezuela	-	-	303	214	82	58	2	1	5	4	392	271
Others ¹	764	359	60	42	119	82	52	26	35	12	1,030	524
Total	59,136	28,950	3,936	2,772	6,359	4,668	3,236	1,619	4,319	1,653	76,986	39,667

¹Includes nations with shipments of less than 100 tons or not individually identified.

Notes: Values converted at the rate of one Portuguese escudo equals US\$0.03472.

Portugal (Contd.):

costs, especially for fillets of anchovies which were sold at the prewar price. By the end of the season, however, the prices for stocks on hand increased--this in turn caused prices to rise to a level which resulted in buyer resistance.

Actually the canned fish pack in 1959 was below that for 1958, and the record high exports were achieved by using the 1958 carry-over stocks.

Exports of canned tuna to Italy suffered due to competition from Japanese and Scandinavian tuna which entered Italy duty free.

The drop in the 1959 pack was due principally to sardines--the 1959 landings were 16,000 tons less than in 1958. But mackerel and tuna landings also dropped in 1959. It was reported that the decline in the landings of sardines was not due to a natural scarcity but rather to the canners not buying to meet their needs because ex-vessel prices were considered too high.

Table 2 - Portugal's Sardine Landings, 1958-59, and 1959 Utilization

Item	Value		
	Metric Tons	1,000 Escudos	US\$1,000
Landings:			
1959	123,314	341,628	11,820
1958	139,339	317,956	11,001
Utilization, 1959:			
Canning	62,204	180,369	6,240
Salting	1,053	1,923	67
Fresh fish	60,057	159,336	5,513
Total	123,314	341,628	11,820

In addition, the industry was plagued by a low selling price for its pack. At one point the price was so low that French packers attempted to keep the Portuguese product out of France. On the other hand, in the latter part of the year an extremely high price prevailed. Although the ex-vessel price for sardines in 1959 was higher than in 1958, the export price for canned sardines was much lower in 1959.

In 1959, sardine landings declined to 123,314 metric tons from 139,339 tons in 1958 (table 2). Of the amount landed in 1959, 62,204 tons were canned. (Conservas de Peixe, April 1960.)

Note: (1) Values converted at the rate of: 1958, 1 escudo equals US\$0.0346; 1959, 1 escudo equals US\$0.0347.

(2) Also see Commercial Fisheries Review, June 1960 p. 60.

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CANNED FISH EXPORTS, FIRST QUARTER 1960:

Portugal's exports of canned fish during the first quarter of 1960 amounted to 16,684 metric tons, or 924,000 cases. Sardines comprised the bulk of the exports with 85.6 percent of the total, followed by anchovy fillets (7.2 percent).

Product	January-March			
	1960		1959	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
Sardines	14,287	752	13,052	672
Chinchards	244	13	-	-
Tuna and tunalike fish	456	13	609	22
Anchovy fillets	1,203	120	1,593	159
Mackerel	58	3	1,361	55
Others	436	23	403	29
Total	16,684	924	17,018	937

During January-March 1960, Portugal's most important canned fish buyers were Germany with 3,732 tons, followed by the United States with 2,114 tons, the United Kingdom with 2,025 tons, and Italy with 1,509 tons. The principal canned fish products imported by the United States were sardines (957 tons) and anchovy fillets (633 tons). (Conservas de Peixe, May 1960.)

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CANNED FISH PACK, FIRST QUARTER 1960:

The total Portuguese pack of canned fish, in oil or sauce, for the first quarter of 1960 amounted to 4,392 metric tons, or 287,000 cases. Sardines accounted for 51.8 percent of the total pack. Anchovy fillets followed with 31.6 percent. (May 1960 Conservas de Peixe.)

Product	January-March 1960			
	1960		1959	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In oil or sauce:				
Tuna and tunalike fish	543	19	1,829	182
Mackerel	2	-	4	-
Chinchard	11	1	-	-
Sardines	2,277	120	1,907	100
Sardinellike fish	24	1	4	-
Anchovy fillets	1,387	138	203	7
Others	148	8	340	17
Total	4,392	287	4,287	306

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FISH CANNING INDUSTRY FAILS TO IMPROVE EXPORT PRACTICES:

The important Portuguese sardine canning industry in 1959 again failed to improve

Portugal (Contd.):

inefficient export practices. Industry leaders and government officials have continued to point out that with about 250 canneries (includes 75 canneries with less than 21 workers) and over 2,000 brands of sardines, Portuguese sardine exports cannot be effectively advertised or marketed. This has been a disappointment to many in the industry who believe Portugal could improve her exports substantially through an agreed reduction of the number of export brands, the adoption of more standard packaging and, especially, an advertising campaign abroad similar to that carried out by Norwegian sardine canners, the United States Embassy in Lisbon stated in a June 21, 1960, dispatch.



Singapore

FISHERIES TRENDS, 1959:

Estimated commercial landings of fishery products in Singapore during 1959 amounted to about 11,300 metric tons. Total consumption (landings plus imports) in 1959 was estimated at about 38,900 tons. The number of fishing vessels licensed in 1959 included 1,904 without power, 639 vessels with outboard motors, and 154 vessels with inboard motors--a total of 2,697 craft.

There is very little processing of fish in Singapore. During periods of good catches some anchovies are boiled in brine and sold as boiled fish. The boiled-in-brine anchovies may also be sun-dried and sold locally as dried "billis." In addition, some red snappers are salt-cured. (United States Consulate, Singapore, report of June 23, 1960.)



South-West Africa

NEW TYPE SPINY LOBSTER
COLLAPSIBLE TRAP TESTED:

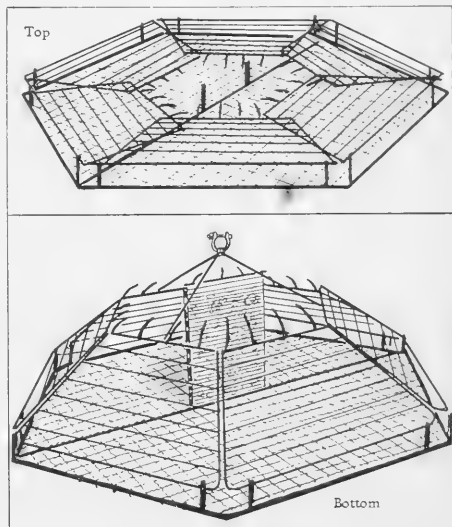
Research vessels of the South-West Africa Administration are conducting tests on a new type of spiny lobster trap which has been designed and developed in South-West Africa for use on the Union and South-West African coasts.

Although the final report on the traps is not yet available, the results of two tests already carried out were as follows:

(1) One trap was lowered to the bottom for 30 minutes in 25 fathoms of water and in a thinly populated area. Upon hauling, it was found to contain 15 fairly large spiny lobsters.

(2) Thirty spiny lobsters were caught and left submerged in the trap, for 15 hours. When the trap was hauled up the lobsters were still in the trap, although there was every indication that they were exhausted.

These results emphasize two of the claims made for the new traps, namely that they are successful in attracting spiny lobsters, and that once in the trap they have little chance of escape.



Top: Spiny lobster trap collapsed for storage.

Bottom: Ready for use--trap is 42 inches across the base and when opened is 9 inches high. Bait basket in center is rectangular, although later models have a triangular bait basket so that it can be collapsed to form an integral part of the trap.

The trap is constructed in the form of a metal framework of truncated pyramid shape with a hexagonal base. The sides slope upwards and inwards to a long opening sufficiently large to allow the lobster to enter the trap. Inside the framework is a wire-mesh bait basket of triangular shape.

In use, the lobsters crawl up the side of the trap to reach the bait in the basket. They cannot take the bait without actually entering the trap, and, once they are inside, the possibility of escape is remote.

South-West Africa (Contd.):

The trap measures 42 inches across the base and is 9 inches high. It weighs less than ten pounds and is estimated to hold between 40 and 50 average-size spiny lobsters. For storage purposes, the traps collapse to a thickness of one inch; enabling boats to carry large numbers in a limited space. It is expected that dinghies will be able to carry more than eight traps.

As the spiny lobster cannot remove bait from the traps, bait expenditure is expected to be considerably reduced. The traps have also been constructed so as not to hook on the sea bottom. They will be manufactured in South-West Africa under a Union patent. (South African Shipping News and Fishing Industry Review, April 1960.)



Spain

LICENSES IMPORTS OF FROZEN TUNA:

The Spanish Government in July 1960 issued import licenses for 10,000 metric tons of frozen tuna. It is reported that there has been a flood of offers from various countries to sell frozen tuna, including some albacore at the low price of US\$180 (delivered in Spain).

The Japanese Government, noting that Spanish canned tuna in brine is at present competing with the Japanese product in the United States market, does not regard exports of frozen tuna to Spain as desirable. Up through July it had not licensed any such exports. However, Japanese trading companies which handle frozen tuna are trying to get Government approval, feeling that otherwise the Spanish market will be completely taken over by other countries. (The Suisan Tsushin, July 21, 1960.)

FISHERIES TRENDS, APRIL-JUNE 1960:

Fish Exchange: A total of 13,923 metric tons of fish were landed during the second quarter of 1960, as compared with 11,968 tons for the previous quarter and 15,165 tons for the second quarter of 1959.

Landings of the most important species during the second quarter of 1960 were: 754 metric tons of albacore (665 tons for the

second quarter of 1959); 1,694 tons of small hake (2,498 tons for the first quarter and 2,571 tons for the second quarter of 1959); and 2,457 tons of horse mackerel (1,198 tons for the first quarter and 1,927 tons for the second quarter of 1959). Second quarter 1960 sardine landings amounted to 1,482 tons (1,083 tons for the first quarter and 962 tons for the second quarter of 1959). Ex-vessel prices for sardines averaged 7.07 pesetas per kilo (5.3 U. S. cents a pound based on a rate of 60 pesetas to US\$1 in effect since July 18, 1959) as compared with 6.52 pesetas per kilo (7.0 U. S. cents a pound based on a rate of 42 pesetas to US\$1) in the same period of 1959.

The average price per kilo for all fish at the Exchange for the total catch during the second quarter of 1960 was 9.41 pesetas (7.1 U. S. cents a pound) as compared with 11.63 pesetas (8.8 U. S. cents a pound) in the first quarter of 1960 and 11.32 pesetas (12.2 U. S. cents a pound) in the second quarter of 1959.

Landings of large hake, which have a high ex-vessel value, increased in the second quarter of 1960 to 234 tons from 85 tons during the previous quarter, but were down sharply from the 538 tons landed in the first quarter of 1959. The average price per kilo for large hake during the quarter was 42.65 pesetas (32.2 U. S. cents a pound) as compared with 56.11 pesetas (42.4 U. S. cents a pound) for the previous quarter and 39.7 pesetas (42.9 U. S. cents a pound) for the first quarter of 1959.

Canning: With the lifting of the ban on sardine fishing in April 1960, and the initiation of the albacore season, canning activity in the Vigo area moved into full gear. Anticipation of another favorable export year has increased demand for both albacore and sardines both of which were in better supply than in the second quarter of 1959. Cannery paid (based on peseta valuation) on the average about 44 percent more for albacore and about 7 percent more for sardines than in the second quarter of 1959.

The amount of fish purchased (2,469 tons) by the canners during the second quarter of 1960 exceeded that of the same period in 1959 by 812 tons, another indication of the industry's optimism as the new canning season got under way.

In addition to the higher costs paid for albacore and sardines, the canning industry is currently paying more for olive oil.

Spain (Contd.):

While the problem of tinsplate supplies, a perennial plague to the canning industry, was resolved by the liberalization of imports of this product, the new customs duties promulgated in June 1960 have raised the price of imports and threaten to raise the cost of nationally-manufactured tinsplate. The new duty, which is 30 percent ad valorem plus an additional charge of 12 percent ad valorem, has raised the price of imports approximately 11 percent. A 195-pound box of imported tinsplate (from Western Europe) which was previously 1,677.21 pesetas (\$27.95), now costs 1,856.70 pesetas (\$30.95). At the present time, because of the unavailability of machinery necessary for the initial lamination process, the national tinsplate industry has not been able to supply the national market, and it is doubted that the higher duties on imported tinsplate will in any way contribute to the solution of the national producers' problems. Cannerymen are particularly resentful of the new duties because in their view they are pointless, and only serve to raise their production costs and offer protection to an industry which is not in a position to make use of it.

Exports: In spite of increased costs for olive oil and tinsplate, Vigo fish cannerymen anticipate another exceptional year, particularly in exports of canned albacore to the United States. Forecasts run as high as double 1959 export levels, which in turn were well above

Authorized Exports of Canned Fish from Vigo Area				
Product	1959		1958	
	Metric Tons	US\$	Metric Tons	US\$
Albacore in brine . . .	1,335	1,050,407	203	168,469
Albacore in oil	15	13,140	10	9,317
Anchovies in oil	193	158,276	154	138,648
Sardines	19	13,475	6	4,056
Other	18	16,086	9	9,357
Total	1,580	1,251,384	382	329,847

¹/Normally actual exports are 6 percent below authorizations.

1958 exports. The actual level of exports will probably depend in large measure on the supply of fresh albacore available for canning. At the moment, the outlook is favorable. One factor, however, which helped boost 1959 exports, which is not present this year, was the surplus stocks unsold from the 1958 canning year, and which were exported in the summer of 1959 when the devaluation of the peseta stimulated the canned fish export boom. (United States Consulate report from Vigo, July 15, 1960.)

* * * * *

NORWEGIAN-TAGGED TUNA
CAUGHT OFF SPANISH MOROCCO:

In June of 1960, a Spanish fishing boat caught a large tuna in the Atlantic off the coast of what was formerly Spanish Morocco, near Larache. When caught the tuna had a harpoon protruding from the dorsal fin area. A reference in Johannes Hamre's book "Annales Biologiques" indicates that the harpoon is of the type used by Norwegians in the summer of 1958 to tag 18 tuna in Norwegian waters. At the time of tagging the largest tuna weighed roughly 263 pounds. The tuna caught off Morocco weighed 397 pounds when landed. So over a two-year period a probable growth of at least 134 pounds took place.



Norwegian tagging harpoon removed from tuna caught off Spanish Morocco.

--Francisco Vallecillo Pecino
Ramon de Carranza
Ceuta, Spain



Sweden

FEW VESSELS TO FISH HERRING
OFF ICELAND IN 1960:

Only 11 Swedish fishing vessels from the Bohus area will take part this year in herring fishing off Iceland. This is a reduction by almost one-half of the number fishing that area in 1959. In 1948, about 80 Swedish fishing vessels (a record number) participated. Since then and up to several years ago the normal number was some 30 vessels. Most of the boats making the journey this year left

Sweden (Contd.):

port on July 18, and were expected back late in September.

Fishermen say that it is most uncertain whether any vessels will make the journey in 1961. The reasons for the sharp drop in Swedish vessels fishing for herring off Iceland are: (1) it has proved difficult to recruit full crews for the boats; and (2) Icelandic fishing has not been especially profitable in late years. This year the financial prospects are said to be poor because of the reduction in the price of herring by one crown per barrel and the firm freight market which has resulted in higher freight costs. Also, a large number of the vessels which formerly took part in Icelandic expeditions are said to be either sold or discarded. Swedish fishermen when fishing for Icelandic herring operate in waters 50-150 sea miles east or northeast of Iceland. (United States Consulate report from Goteborg, July 11, 1960.)



Tunisia

TUNA INDUSTRY CONTINUES TO USE FOREIGN LABOR:

Despite the firm intention announced in 1959, by the Tunisian Government to use only local labor at the Sidi Daoud tuna cannery on Cap Bon and the takeover of the cannery by the Tunisian National Fisheries Office, certain skilled jobs traditionally performed by Portuguese women and Spanish seamen are still held by nationals of those countries.

The tuna fishing season in Tunisia runs from early May to early July. This season 19 Portuguese women were employed to pack tuna meat in cans, while 30 Tunisian women were being trained. The Portuguese labor will be eliminated as soon as possible, according to Tunisian officials.

Captains of fishing boats traditionally have been Spaniards who follow the tuna across North Africa, working for a series of canneries. This season, 1 Spanish captain and 7 other Spaniards were employed at Sidi Daoud. The Director of the National Fisheries Office said skills required by the tasks and the seasonal nature of the employment make it unlikely they will be replaced by Tunisians in the near future, the

United States Embassy in Tunis reported on July 7, 1960.



Turkey

ISKENDERUN FISHERY TRENDS, JUNE 1960:

An Austrian citizen who resides in the United States and who has been the leading figure in the Iskenderun (on eastern edge of Mediterranean) fishing industry for the past 6 or 7 years reports that the shrimp catch (September 1959-May 1960) was below normal, amounting to about 50 tons. Approximately 28 tons were exported to Syria and Lebanon and the remainder consumed in Turkey. There were no exports during the 1959/60 season to the United States due to price factors. The Austrian citizen explained that shrimp has been abundant in the United States, and the prices in New York have been too low. Turkish shrimp, although of excellent size and quality, cannot be sold profitably in the United States at less than 75 cents a pound. On the other hand, the demand in Syria and Lebanon has been strong and prices correspondingly high. As to the future, the Austrian citizen believes the prospects for shrimp exports to the United States may improve due to higher prices at New York. Egypt and Lebanon have recently signed a commercial agreement which grants Egyptian shrimp duty-free entry into Lebanon. The result has already been noted in reduced exports of Iskenderun shrimp to Beirut, Lebanon. Syria, particularly Aleppo, is now the main market for Iskenderun's fish products. This and other factors may favor the export of Iskenderun shrimp to the United States, but the volume will not exceed 5-10 tons and will in all probability be less, according to the Austrian citizen.

In June this year the Austrian was in Iskenderun awaiting the turtle season which this year has failed to materialize. Last year he slaughtered over 2,000 turtles and shipped the frozen meat to West Germany. This year, for reasons no one understands, there have been none. The eel catch from Amik Lake near Ankara has also been far below normal this year for equally mysterious reasons. The Austrian citizen is turning his attention to the development of yellow pike in Turkey. Last year he shipped a few sample packages of yellow pike filets, caught in the lakes near Samsun and Izmir, to a number of places including Philadelphia and Buffalo. The results were excellent, and he believes the possibilities abound to develop this fish in many areas of Turkey. He cites the lakes that have been created behind dams such as the Seyhan in Adana as excellent breeding grounds for yellow pike or carp. He says the program to develop fresh-water fish in Turkey would only require a little know-how and initiative and very little capital and cites his experience in developing the fish industry in Israel as supporting evidence. He is not optimistic that the Turks can or will supply any of these necessary ingredients.

The manager of the Iskenderun Meat and Fish Office confirms that there have been no recent shrimp exports to the United States and that the past season has been a poor one for the local fishing industry. He attributes this in part to the primitive methods and equipment used and the lack of any organized development program. The variation in the quantity of shrimp from year to year cannot be explained. The manager also mentioned a project to establish a canning plant for eels and turtle meat in Iskenderun, which he believes an American firm in conjunction with local fishing firms is considering. He thinks such a venture would be successful and would promote the local production of these items and possibly others. It could also be an important foreign-exchange earner. (United States Consulate in Iskenderun, Turkey, reported on June 24, 1960.)

U. S. S. R.

POLAND AND EAST GERMANY EXPORT FISHING VESSELS TO SOVIET UNION:

Poland and East Germany have become important exporters of fishing craft to the Soviet Union. By the end of 1965 Poland is scheduled to deliver 19 vessels of the "Leskowsk" type, combination trawlers and factoryships of 1,250 tons, according to the June 7 issue of Vodnyj Transport.

During the last two years Poland has delivered 4 motherships and in 1960 will deliver 3 more of the same type. Each of these has the capacity to receive and process the catch of 4 trawlers.

East Germany delivers to the Soviet Union annually up to 75 medium trawlers with cold-storage facilities. At present East German shipyards are building vessels of the "Tropik" type which are designed to fish for sardines and tuna. A number of these vessels will be delivered next year. (Fiskets Gang, July 7, 1960.)



United Kingdom

DIELECTRIC METHOD FOR THAWING FISH DEVELOPED:

The industrial thawing of frozen fish which normally takes up to 24 hours in air, can now be done in about 15 minutes by dielectric heating. This new development is the result of work at the Torry Research Station in Aberdeen, Scotland.

It is of economic importance, especially in view of the steadily increasing large-scale utilization of frozen fish.

The method, known as dielectric thawing, depends on the fact that if any material is placed between, but without touching, two metal plates which are charged with an alternating voltage of many thousands of volts at a frequency of about 40 million cycles per second, energy is produced in the material in the form of heat.

Under well defined conditions, fish may be uniformly thawed throughout a block of the frozen material--either as whole fish as in the case of herrings, or as fillets. It is possible to control conditions far more accurately than in existing methods, for ex-

ample, so that individual fish in a block may be separated while remaining partially frozen.

Laboratory-scale experiments at the Research Station have shown that it is possible to use dielectric heating successfully on tiny pieces of frozen fish. Pilot-scale apparatus, using slightly modified equipment which is commercially available, was therefore set up. Initially, the problem of "runaway heating" was encountered; small portions of blocks of fish absorbed the major part of the available energy and became cooked, while the rest of the block remained hard-frozen.

This problem has now been solved, and fish may be fed into the machine on an endless belt and thawed in 15 minutes.

The implications of this work are very wide. At present fish is thawed by laying it out in the air; it is sometimes, in addition, sprayed with water. Under these conditions, fish on the outside of a block thaws quickly and begins to deteriorate, while that in the middle remains frozen. Apart from possible deterioration, however, existing methods are slow, require much labor and factory space, and are unsuitable for fish factories with production lines.

The new method requires no handling during thawing, is quick, and therefore keeps deterioration to a minimum, and the equipment occupies only a few square yards of floor space.

The capital cost--about £10,000 (US\$28,000) for equipment to thaw one ton of fish per hour--is comparable to that for freezing equipment of similar capacity.

Running and depreciation costs appear to compare favorably with the costs of existing methods of thawing.

The potential results of this development, which is the subject of a patent application, are such that they could revolutionize certain sections of the fish handling and processing industry in a relatively short space of time. (Fishing News, July 8, 1960.)

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JAPANESE NEGOTIATE FOR PURCHASE OF WHALING FLEET:

A British whaling company announced on July 12, 1960, that conditional agreement

United Kingdom (Contd.):

(subject to approval by the Japanese Government) had been reached with a Japanese whaling company for the sale of the British fleet consisting of the factoryship Balaena, the refrigerated vessel Enderby, and 7 whale catchers. The total book value of the British fleet as of July 31, 1959, was £1,711,858 (US\$4,793,000). Net proceeds from the sale are estimated to be about £2.5 million (US\$7 million).

Although the British firm gave no reason for disposing of their whaling fleet, it is believed to be due to dwindling profits from Antarctic whaling. The British firm had a net profit of £71,333 (\$200,000) in 1958, but showed a net loss of £490,471 (\$1,373,000) in 1959.

Additions to Japanese and Russian whaling fleets and a limited resource, plus declining world whale-oil prices may be contributing factors to the British firm's decision to dispose of its fleet. Whale oil that sold in London in 1950 for £127.10.0 (\$357) a long ton had dropped to £77.10.0 (\$217) in 1958 and sold for only £72.10.0 (\$203) a long

ton in 1959 and 1960. The Japanese, with a good market for whale meat, are not so dependent on the world price for whale oil in order to operate at a profit. (U. S. Embassy in London, July 14, 1960.)

* * * * *

**TRADERS DISTURBED THAT
U. S. FISH MEAL DEMAND
HAS DROPPED OFF:**

United Kingdom traders in protein meals are disturbed by reports that the United States demand for fish meal this year would be less than a year ago. It is pointed out in Britain that fish meal prices have dropped some 40 percent since Christmas and that with Peru producing large quantities, only the United States can relieve the distressed market situation. Imports of fish meal have been increased by most European countries during the past six months, but demand is normally more unelastic in Europe than in the United States.

It is claimed that for the first time, animal protein meal is selling at less than vegetable meal. (United States Embassy, London, report of July 18.)



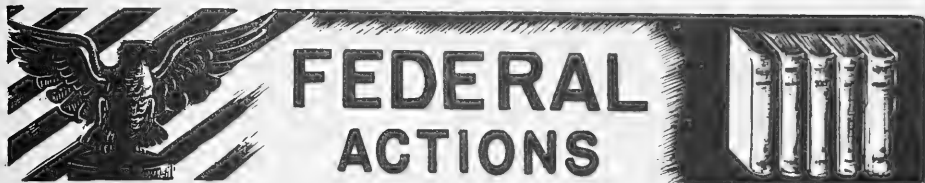
MANATEE FOR AQUATIC VEGETATION CONTROL?

The Review, vol. 22, no. 4 (April 1960), on page 5, reported that the Food and Agriculture Organization and the Indo-Pacific Fisheries Council are exploring the possibility of introducing manatees (sea cows) into Ceylon and Thailand to control aquatic vegetation.

The Director of the Fisheries Division, FAO, wrote on August 23, 1960, that the report is substantially incorrect and misleading since neither FAO nor the IPFC are studying the practicability of such an introduction nor are they backing such a project.

The Director in his letter points out that the genesis of the statement may lie in the fact that a project for water-weed clearance in navigable waterways, including a study of several methods, including the use of "herbivorous water animals," was listed in the Report of the Inland Transport Committee (7th Session) to the Economic Commission for Asia and the Far East 14th Session, Malaya, 1958. The cooperation of TAA and/or FAO was to be sought.

Some information on the control of aquatic weeds (especially with 2, 4-D) and including the available data on manatees and nutria was sent to the Transport Division of ECAFE at its request by FAO's Regional Fisheries Officer in Bangkok. However, this constituted FAO's only contribution to the study.



Federal Trade Commission

SHRIMP-PROCESSING MACHINERY FIRM DENIES CHARGES OF UNFAIR COMPETITION:

A New Orleans shrimp-processing machinery firm has denied Federal Trade Commission charges of using unfair methods of competition which have unlawfully hindered its competitors in the shrimp-processing machinery business (answer 7887, Shrimp). Joining in the firm's answer are the firm's 6 active partners, who were cited in the May 13, 1960, complaint of the Commission as the firm's active partners and as representative of approximately 26 limited partners.

A separate answer was filed by the Houma, La., packing company, which is a silent partner and also is owned and controlled by members of the family owning the New Orleans shrimp-processing machinery firm. The Houma company processes and cans raw shrimp which is taken primarily from the Gulf Coast fishing area; and the New Orleans firm leases, licenses, and sells shrimp-processing machinery, such as cleaners, graders, deveiners, and separators.

Both companies deny Commission allegations that they have combined in carrying out various unfair practices engaged in by the New Orleans firm, and that these practices have given the New Orleans firm a virtual monopoly in the domestic shrimp-processing machinery industry and otherwise lessened competition.

For example, the complaint alleged, the New Orleans firm has obtained exclusive rights to processing machinery through agreements with patentees and prospective patentees but in most instances never attempted to manufacture, develop, or commercially exploit the machinery; also, the firm has acquired from inventors rights to all their future inventions in this field.

To this, the company refers to the agreements "for a full and complete statement of the terms thereof."

The complaint also charged that the New Orleans firm unfairly filed patent infringement suits against manufacturers and users of a competitive peeler developed by a New Orleans inventor and patented by him in 1957.

Defending its actions, the New Orleans company declared that this peeling machine was a full infringement of, and has been judicially held to be a full infringement of its valid and existing patent rights. The answer adds that the company "intends to assert and will assert its patent rights against any other purchaser or user or manufacturer" of such machines.

The respondents ask dismissal of the complaint. The New Orleans firm's answer to Commission charges was released by the Commission on July 26, 1960.

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TWO MARYLAND CLAM-DIGGER ASSOCIATIONS CONSENT TO ORDER FORBIDDING PRICE-FIXING:

Two Maryland clam-digger associations have consented to a Federal Trade Commission order (Consent Order 7578, Seafood) forbidding them to fix and enforce prices and selling conditions for seafood and to boycott dealers seeking better prices.

The Commission affirmed Hearing Examiner Edward Creel's order filed May 23, 1960, which had been agreed to both by the respondents and the Commission's Bureau of Litigation.

In its complaint of September 2, 1959, the Commission charged that since 1958 the respondents had conspired to suppress competition among themselves and between them-

selves and others in the purchase or sale of soft-shell clams harvested in the Chesapeake Bay region.

Under this conspiracy, the complaint alleged, they (1) established and maintained uniform and noncompetitive prices and terms for the purchase or sale of their clams; (2) boycotted dealers who purchased or sought to purchase at less than the fixed prices; and (3) used threats of reprisals, intimidation, and physical violence and other means to enforce adherence to their prices and terms.

The Commission's order halting these practices provides, however, that any association of bona fide clam fishermen acting pursuant to the Fisherman's Cooperative Marketing Act is not prevented from performing any acts permitted by that statute.

The agreement is for settlement purposes only and does not constitute an admission by the respondents that they have violated the law.

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TWO FISHERIES FIRMS FORBIDDEN TO PAY ILLEGAL BROKERAGE:

Two Seattle, Wash., fishery firms are forbidden to pay illegal brokerage to their customers under the terms of a consent order announced July 18, 1960, by the Federal Trade Commission (Consent Order 7652, Seafood).

The Commission affirmed its hearing Examiner's initial decision based on an order agreed to by the Commission's Bureau of Litigation, the two companies, and their president and sales manager.

The concerns were charged in the complaint of August 6, 1959, with giving certain purchasers of their seafood pack allowances in lieu of brokerage or price concessions reflecting brokerage, in violation of Sec. 2 (c) of the amended Clayton Act. According to the complaint, a typical method used was to give these customers or their agents price reductions which were coupled with or offset wholly or partly by reducing the broker's fee earned on the sales.

The respondent's agreement to discontinue the challenged practices is for settlement purposes only and does not constitute an admission that they have violated the law.

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Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

NEW TRAINING PROGRAM FOR KEY EXECUTIVES INITIATED:

A new program designed to broaden the experience of key executives both in the Washington and field offices of the Bureau of Commercial Fisheries will be initiated this month, Commissioner of U. S. Fish and Wildlife Arnie J. Suomela announced on August 10.

The first step in the program involves the exchange of headquarters--and homes--for most of next year by a Division Chief in the Washington, D. C., office and the Area Director of California.

H. E. Crowther, Chief of the Division of Industrial Research in Washington, D. C., went to California in mid-August to take over the duties of Area Director in charge of the Bureau's Area Office at Terminal Island, Calif.

Donald R. Johnson, now Area Director for California, reported to Washington late in August for approximately a year.

In his new capacity, Crowther is responsible for line supervision of all phases of the Bureau's activities in California where the tuna, sardine, and oceanographic research programs are of major importance. In his Washington office position, Crowther has had staff supervision of industrial research programs for the country as a whole.

Crowther's duties in Washington are being handled by Charles Butler, Saltonstall-Kennedy Program Coordinator. This gives Johnson the opportunity to gain experience in all the fields in which the Bureau functions since he will serve several months in a staff capacity in the four Divisions--Administration, Biological Research, Industrial Research, and Resource Development--and in the Office of the Director of the Bureau.

Other similar exchanges of personnel are planned for the future.

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PROPOSED REGULATIONS FOR FISHING VESSEL CONSTRUCTION SUBSIDY:

A notice of Proposed Rule Making covering procedures for the Fishing Vessel Construct-

tion Differential Subsidy Program was published in the Federal Register of August 10, 1960. Interested parties had until September 9, 1960, to present suggestions or comments.

This program cannot take effect until the final regulations are promulgated and funds are appropriated. There is a possibility that funds will be appropriated during the present session of Congress.

The proposed regulations as published cover the basis and purpose of the program, definitions, eligibility requirements, applicants, subsidy, contract, inspection of vessels, and payment of subsidy.

The Act of June 12, 1960 (Public Law 86-516) authorizes the Secretary of the Interior to pay a subsidy for the construction of fishing vessels in shipyards of the United States.



Department of Labor

WAGE AND HOUR DIVISION

COMMITTEE APPOINTED TO INVESTIGATE AND RECOMMEND MINIMUM WAGES IN PUERTO RICO FOR FOOD AND FISHERY INDUSTRY:

The appointments to, convening, and notice of hearings of committees to investigate and recommend minimum wages in various industries in Puerto Rico were announced in the Federal Register of July 29, 1960. Among the committees appointed was one for the food and related products industry (Industry Committee No. 49-A), which was to concern itself with the phases of the food industry which had to do with canning, preserving (including freezing, drying, dehydrating, curing, pickling, and similar processes), and packaging of foods, including meat animals, poultry, milk, and fish and seafood products, etc.

To the committee was referred the question of the minimum wage rates to be fixed under the provisions of section 6(c) of Fair Labor Standards Act of 1938, as amended. The committee was asked to investigate conditions in its industry, hear witnesses, and receive evidence. The committee convened on August 15, 1960, in San Juan, Puerto Rico. After the public hearings, the committee was instructed to recommend to the Wage and Hour Administrator the highest minimum wage rates for the industry covered by the commit-

tee. Therefore, the committee, among its recommendations, will include recommended wage rates for the canning and processing of fishery products in Puerto Rico.



Eighty-Sixth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to Committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as Signature into law or other final disposition are covered.



BUY AMERICAN ACT: H. R. 13025 (Van Pelt) on August 17, 1960, introduced a bill to amend title III of the Act of March 3, 1933, commonly referred to as the Buy American Act, so as to provide that, to the maximum extent practicable, the procurement of articles, materials, and supplies by the Federal Government shall be limited to articles, materials, and supplies domestically produced or manufactured; referred to the Committee on Public Works. Provides for purchase of other than United States-produced goods by Federal Government if quantity produced in United States is not sufficient or available in reasonable commercial quantities.

CHEMICAL PESTICIDES COORDINATION ACT: Regarding a request in the House to consider H. R. 12419, a bill to provide for advance consultation with the Fish and Wildlife Service and with State wildlife agencies before the beginning of any Federal program involving the use of pesticides or other chemicals designed for mass biological controls, one objection was voiced on August 23 and the bill was passed over.

COLD SPRING HARBOR MARINE BIOLOGICAL RESERVE: S. J. Res. 218 (Murray), on August 15, 1960, introduced a joint resolution to authorize the Secretary of the Interior to establish the Cold Spring Harbor Marine Biological Reserve; referred to the Committee on Interior and Insular Affairs. Would preserve in perpetuity the inner harbor of Cold Spring Harbor, Long Island, N. Y., because it is an unusual confluence of fresh and salt water in a protected area containing particularly rich marine flora and fauna. Since it has been the subject of marine research for 70 years and since the town of Oyster Bay plans to dredge the inner harbor, this bill was introduced to preserve the area's unique features.

COLUMBIA RIVER BASIN FISHERY RESOURCES (Hearings before the Committee on Interstate and

Foreign Commerce, United States Senate, 86th Congress, 1st Session, on S. Con. Res. 35, a concurrent resolution to make an investigation concerning anadromous fish and S. 2586, a bill to provide for the conservation of anadromous fish spawning areas in the Salmon River, Idaho, and S. 1420, a bill to promote the conservation of migratory fish and game by requiring certain approval by the Secretary of the Interior of licenses issued under the Federal Power Act, November 10 and 12, 1959), Part 2, Astoria, Oreg., and Lewiston, Idaho; 430 pp., printed. Contains letters, statements, and resolutions from the public and local government agencies.

FEDERAL FISHING STAMP (Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, 86th Congress, 2nd Session, on H. R. 11410, May 31 and June 1, 1960), 58 pp., printed. Contains testimony presented by Government representatives; certain Departmental and Commission reports; and information, letters, and statements on the use of a Federal-State fishing stamp in connection with noncommercial fishing licenses for nonresidents of states.

FISH & WILDLIFE COOPERATIVE RESEARCH TRAINING UNITS: On August 23, 1960, the House passed S. 1781, a bill to establish cooperative unit programs of research, education, and demonstration between the Federal Government, colleges, and universities, the states and territories, and private organizations in the field of fish and wildlife resources. The Senate passed this bill May 4, 1960. The bill would continue a program which is already in progress. Senate on August 27 presented the bill to the President for signature.

FISHING VESSELS AND FREIGHTING OF FISH: H. R. 13052 (Kilgore) introduced in the House on August 19, 1960, a bill relating to documentation and inspection of vessels of the United States; referred to the Committee on Merchant Marine and Fisheries. Regarding United States laws relating to documentation and inspection of vessels of the United States, the bill reads as follows: "a vessel enrolled and licensed, or licensed, as a vessel of the United States to engage in the fishery, shall not be deemed to be used in employment for which not licensed, and shall not be subject to inspection, solely because such vessel takes on board on the high seas and transports without charge to a port of the United States the catch of another fishing vessel of the United States."

ICA GRANTS FOR FISHERIES: On August 24, 1960, Senator Gruening ordered to be printed in the Congressional Record, ICA grants to foreign countries for fishery projects for the past 5 fiscal years. Grants for 1955 totaled \$1,431,561; 1956, \$2,355,503; 1957, \$3,415,000; 1958, \$1,526,000; and 1959, \$2,201,000.

IMPORTED COMMODITY LABELING: Presented to the President for signature August 26 by the House was H. R. 5054, an act to amend the Tariff Act of 1930 with respect to the marking of imported articles and containers. Provides that when articles, imported in containers required to be marked, are repackaged in the United States and offered for sale, the new package shall be marked with the name of the country of origin. Imported items which are processed in this country sufficiently to become an American manufacture are not included in the purview of the legislation and would not be affected. Passed House February 2; passed Senate July 2.

INSURANCE INDUSTRY: S. Rept. 1834, The Insurance Industry--Aviation, Ocean Marine, and State Regulation (August 10, 1960, 86th Congress, Second Session, Report of the Committee on the Judiciary Together with Individual Views made by its Subcommittee on Antitrust and Monopoly pursuant to S. Res. 238), 343 pp., printed. The March 9, 1945, McCarran-Ferguson Act of Public Law 15, established that the Federal antitrust laws "were applicable to the business of insurance to the extent that such business is not regulated by State law." This report is the first comprehensive effort by Congress to reexamine the insurance industry in the light of the McCarran-Ferguson Act and to measure the effectiveness of state regulation. This report deals essentially with the hearings relating to aviation insurance and ocean marine insurance, and the additional study by the subcommittee of the structure of state regulation. With regard to ocean marine insurance, the report deals with the industry structure, exemption from antitrust laws, the Federal Trade Commission investigation (discusses marine extension clause, agreements as to hull forms, protection and indemnity coverage, rating formula), and the nature and operation of American Hull Insurance Syndicate.

INTERNATIONAL FOOD AND RAW MATERIALS RESERVE: S. Res. 357 (Humphrey) introduced in the Senate August 9; referred to the Committee on Foreign Relations; Resolved, That it is the sense of the Senate that the President should explore with other nations the establishment of an International Food and Raw Materials Reserve under the auspices of the United Nations and related international organizations for the purpose of acquiring and storing in appropriate countries raw or processed farm products and other raw materials, exclusive of minerals, with a view to their use in (1) preventing extreme price fluctuations in the international market in these commodities; (2) preventing famine and starvation; (3) helping absorb temporary market surpluses of farm products and other raw materials (exclusive of minerals); (4) economic and social development programs formulated in cooperation with other appropriate international agencies. Participation by the United States in such an International Food

and Raw Materials Reserve shall be contingent upon statutory authorization or treaty approval, as may be appropriate.

Senate Committee on Foreign Relations on August 29 ordered favorably reported its original S. Con. Res. 116, expressing the sense of the Congress that the President should explore the creation of an International Food Program (S. Rept. 1922). Resolution provides for an international food program for furnishing food to less-favorably situated peoples with a view to its use in --(1) combating extreme price fluctuations in the international market; (2) alleviating famine; (3) helping absorb temporary market surpluses of farm products; (4) economic and social development programs.

H. Con. Res. 729 (Wolf), favoring further explanation for the establishment of an international food program for relief purposes, was introduced in the House August 29; referred to the Committee of Foreign Affairs.

S. Con. Res. 116 was received by the House and referred to the Committee on Foreign Affairs.

IRRADIATION OF FOOD: National Food Irradiation Research Program (Hearing before the Subcommittee on Research and Development of the Joint Committee on Atomic Energy, Congress of the United States, 86th Congress, second session, on national food irradiation research program, March 31, 1960, Part 2, 229 pp., printed. Contains statements from Atomic Energy Commission and Defense Department, and Department of Army witnesses; additional material submitted for the record by various Federal officials involved in the program. Appendixes include reports of various tests and studies made on acceptability of irradiated food products. Also included is a short bibliography on food preservation by irradiation.

OUTER CONTINENTAL SHELF AREA RESTRICTIONS IN GULF OF MEXICO: S. 3847 (Murray by request) introduced August 15, 1960, a bill to provide for the restriction of certain areas in the outer Continental Shelf for defense purposes, and for other purposes (Matagorda Water Range); referred to the Committee on Interior and Insular Affairs. Similar to S. 3866 (Murray) introduced in the Senate August 18, 1960.

PUBLIC WORKS APPROPRIATION BILL, 1961: By unanimous vote, the Senate on August 10, 1960, passed with amendments H. R. 12326, making appropriations for civil functions administered by the Department of the Army, certain agencies of the Department of the Interior, the Atomic Energy Commission, the Tennessee Valley Authority and certain study commissions, for the fiscal year ending June 30, 1961. The Senate insisted on its amendments and asked for a conference and appointed conferees. H. R. 12326 was passed by the House May 25, 1960.

On August 22, 1960, the House disagreed to Senate amendments to H. R. 12326, agreed to a conference, and appointed conferees.

Conference report was submitted to House August 26 on H. R. 12326 (H. Rept. 2181). Includes funds to permit detailed studies by the Fish and Wildlife Service of numerous Corps of Engineers and Bureau of Reclamation projects in the United States. These studies are provided for in the Fish and Wildlife Coordination Act which require that the Fish and Wildlife Service determine the probable effects on fish and wildlife resources of water control projects under the jurisdiction or control of the Federal Government and to insure that fish and wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development programs. Measures are recommended to protect and, where possible, to develop and improve fish and wildlife. Also includes funds for Lower Columbia River Fisheries Development, and Lower Columbia River fish sanctuary program for operation and maintenance by the U. S. Fish and Wildlife Service.

SCIENCE AND TECHNOLOGY COMMISSION: S. 1851, for the establishment of a commission on a Department of Science and Technology was passed over on August 19. Reported in Senate June 18, 1959, by the Committee on Government Operations (Senate Report No. 408). A similar bill, S. 3887 (Humphrey), was introduced in the Senate on August 25; referred to the Committee on Government Operations.

SHRIMP IMPORTS: On August 24, 1960, the Senate Committee on Finance adopted a committee resolution directing the Tariff Commission to make a thorough study of the shrimp industry and report to the Finance Committee early in the next session of Congress.

SMALL BUSINESS: Small Business Administration, 1960 (Annual Review of Programs and Activities of the Small Business Administration--Hearings before the Select Committee on Small Business, United States Senate, 86th Congress, Second Session, July 1, 1960. Part 2--Review of Lending Policies of the Small Business Administration, 59 pp., printed. Contains testimony, memorandums, tables, and charts concerned with a general review of the Small Business Administration's lending policies from July 1, 1958, to June 30, 1960.

SMALL BUSINESS ACT AMENDMENTS: On August 25, 1960, the Senate insisted on its amendments to H. R. 11207, to amend the Small Business Act so as to authorize an additional \$150 million for loans to small business, agreed to conference requested by House, and appointed conferees. On the same day, the House disagreed to Senate amendments to H. R. 11207, requested a conference with the Senate, and appointed conferees.

SMALL BUSINESS ADVISORY SERVICES: H. R. 13039 (Schwengel) introduced in the House on August 18, 1960, a bill to amend the Small Business Act to improve and promote the development of a sound United States economy through the establishment of a program of advisory services to small business and other concerns, referred to the Committee on Banking and Currency. Provides for assistance to local communities by appointing advisory specialists to aid, advise, and inform small business concerns.

SMALL BUSINESS AND IMPORTS: The Select Committee on Small Business submitted on August 23, 1960, a report to the Senate entitled "Impact of Imports on Small Business" (S. Rept. 1908). The Small Business Committee's report briefly reviews existing and proposed legislation regarding tariffs and trade. "Our desire," said Senator Randolph on releasing the report, "was to provide for small businessmen an introduction to the aids that are now available to them, as well as to some of the ideas that have been advanced for improving the aids, when import competition becomes a serious problem." The Committee in its report makes six recommendations to ease the adverse effects of imports on small business.

Impact of Imports on American Small Business (Hearing before a Subcommittee of the Select Committee on Small Business, United States Senate, 86th Congress, 2nd session, on the Impact of Imports on American small business, June 16, 1960), 321 pp., printed. Contains statements from Congressmen, Federal officials, and the public.

Senate Report No. 1908, Impact of Imports on Small Business (August 23, 1960, 86th Congress, Second Session, Report of the Select Committee on Small Business), 21 pp., 1 graph, printed. Discusses the history of import controls, impact of imports on small business, Federal help available to small business, legislative proposals before Congress, and recommendations of the committee.

STATE DEPARTMENT APPROPRIATIONS: The House on August 22, 1960, disagreed to Senate amendments to H. R. 11666, the State, Justice, and Judiciary appropriation bill for 1961, agreed to a conference, and appointed conferees. The bill, which passed the House April 13, 1960, and the Senate June 30, 1960, provides funds for the United States to meet its obligations in connection with participation in nine international fisheries commissions.

On August 23, 1960, a conference report on H. R. 11666 was submitted to the House (H. Rept. 2136).

House Report No. 2136, Departments of State and Justice, the Judiciary, and Related Agencies Appropriation Bill, 1961 (August 23, 1960, 86th Congress, Second Session, Report from the Committee of Conference, to accompany H. R. 11666), 8 pp., printed. Contains the recommendations of the Conference Committee regarding this appropriation bill, which includes funds for nine inter-

national fisheries commissions. But none of the commissions are mentioned in this report since there was no disagreement between the House and Senate on the amount of funds to be provided for the commissions.

On August 24, 1960, the House considered and adopted conference report on H. R. 11666. The Senate on the same date also considered and adopted the conference report and cleared the bill for the President. Conference action provided \$1,875,000 for International Fisheries Commissions. This amount is the same as in the Senate and House bills. It is a little under the 1961 estimate of \$1,925,000 and a little over the 1960 appropriation of \$1,725,000. H. R. 11666 was passed by the House April 13, 1960, and by the Senate June 30, 1960. House presented bill on August 26 to the President for signature.

SUPPLEMENTAL APPROPRIATIONS FY 1961: The Senate Committee on Appropriations held hearings on August 14 on proposed supplemental items to be included in Second Supplemental Appropriations Bill for Fiscal Year 1961. Among the testimony presented was that by Andrew W. Anderson, Bureau of Commercial Fisheries, on funds for fishing vessel subsidies and Pacific Coast tuna research program.

H. R. 13161 (Thomas), a bill making supplemental appropriations for the fiscal year ending June 30, 1961, and for other purposes; introduced in the House August 26; House Committee on Appropriations on August 26 reported the bill to the House without amendment (H. Rept. No. 2166). Referred to the Committee of the Whole House on the State of the Union. Passed the House on August 26, 1960. This bill contains \$100,000 for tuna research program and \$500,000 to initiate the fishing vessel differential construction subsidy program. By a voice vote the House August 26 passed H. R. 13161. House-passed bill on August 27 was reported to the Senate (S. Rept. 1925).

House Report No. 2166, Second Supplemental Appropriation Bill, 1961 (August 26, 1960, 86th Congress, Second Session, Report from the Committee on Appropriations, to accompany H. R. 13161), 18 pp., printed. Contains summary of bill and Committee recommendations. Includes additional funds for a number of agencies and departments. For the Bureau of Commercial Fisheries the Committee allowed \$100,000 (a reduction of \$200,000 in the budget request) to expand tuna research in the Eastern Pacific. The Committee pointed out, "A total of \$1,076,000 was recently made available for tuna research in the regular 1961 Appropriation Act, including \$322,600 to continue special research on Eastern Pacific tunas which has been conducted over the past three years at a cost of \$760,000. Effective use of the additional amount provided together with available funds should provide an adequate program during the remainder of the current fiscal year." The Committee also approved \$500,000 of the \$1,000,000 requested to initiate the program for payment of cost differential subsidies for construction of

fishing vessels in United States shipyards as authorized by Public Law 86-516, approved June 12, 1960. "The amount provided should be adequate for requirements during the remainder of the current fiscal year," states the Committee. Also provided \$100,000 for the Bureau of Sport Fisheries and Wildlife for emergency repair of flood damage at three national wildlife refuges, and \$150,000 for emergency dredging of the Oxbow Channel at the De Soto National Wildlife Refuge.

Senate on August 29 passed H. R. 13161, after adopting by voice vote most committee amendments.

TERRITORIAL WATERS EXTENSION FOR ALA., MISS., AND LA.: S. 3851 (Hill for himself and Sparkman), introduced in the Senate on August 15, 1960, a bill to amend the Submerged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana as extending three marine leagues into the Gulf of Mexico and providing for the ownership and use of the submerged lands, improvements, minerals and natural resources within said boundaries; referred to the Committee on Interior and Insular Affairs. Gives the three states the same seaward boundaries (3 marine leagues, almost 10½ statute miles) as the Supreme Court awarded to Florida and Texas. Similar bills were introduced in the House on the same day: H. R. 12964 (Roberts); H. R. 12966 (Boykin); and H. R. 12972 (Huddleston). Also H. R. 12994 (Elliot), H. R. 12996 (Mc Sween), and H. R. 12997 (Selden) were introduced August 16, 1960, in the House; and H. R. 13199 (Brooks of La.) introduced in House August 29, 1960.

WAGES--MINIMUM HOURLY RATE INCREASE:

On August 10, 1960, the Senate debated S. 3758, proposing amendments to the Fair Labor Standards Act, and raising the minimum hourly wage to \$1.15 effective January 1, 1961, to \$1.20 in 1962, and to \$1.25 in 1963. The present law provides a complete exemption from both the minimum wage and overtime requirements for fishing operations and for the processing of seafood. Seafood canning, however, is now covered by the minimum wage under the existing law and has an exemption only from the overtime requirements. The Senate bill changes the exemption with respect to the processing (freezing, preserving, packing) of seafood. Employees engaged in fish-processing activities are brought under the minimum wage provisions on the same scale as newly-covered employees in retail and service enterprises, but they will continue to be exempt from the overtime requirements. However, fishing and activities at sea will continue to be exempt from minimum-wage coverage. The companion bill, H. R. 12677, passed the House June 30, 1960. The bill as passed by the House, would raise the \$1-an-hour-minimum to \$1.15 for workers now covered by the law effective January 1, 1961. It would also bring another 1.4 million retail workers under the law's protection but their minimum would be \$1 an hour and they would not receive overtime payments. Section 13 of the Fair Labor Standards Act of 1938 is amended so that the exemption for

the fishing industry in (a)(5) reads: "any employee employed in or necessary to the conduct of catching, taking, harvesting, cultivating, 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 including employment in or necessary to the conduct of the loading, unloading, or packing of such products for shipment or in propagating, processing (other than canning), marketing, freezing, curing, storing, or distributing the above products or byproducts thereof;" and the exemption for the fish canning industry in (b)(4) reads: "any employee employed in the canning of any kind of fish, shellfish, or other aquatic forms of animal or vegetable life, or any byproduct thereof." But the fish canning exemption is still limited to those employees "employed in the canning of any kind of fish." Present overtime exemption for fish canners and processors is not changed by the bill as passed by the House. While the Senate bill does not add to the fish-canning section the broader language added to the fish-processing part of the house bill, the Senate Committee on Labor and Public Welfare on June 27 stated: "The present exemptions in sections 13 (a) (5) and 13 (b)(4) have been judicially interpreted to apply to all employees employed in the seafood industry including any employee who participates in activities which are necessary to the conduct of the operations specifically described in the exemptions (McComb v. Consolidated Fisheries Company, 174 F. 2d 74, C. A. 3, 1949). These interpretations are consistent with the congressional purpose of treating all employees of one establishment in the same manner under the act and of avoiding segmentation as between different employees of the same employer engaged in the named operations."

Senator Stennis on August 12, 1960, submitted an amendment to be proposed by him to S. 3758, to retain the fisheries exemption and strengthen it by adding the words, "or necessary to the conduct of," both in the fresh and frozen fish and canned fish provision. The amendment submitted reads: On page 19, beginning with line 8, strike out through line 16, and insert the following: "(5) Any employee employed in or necessary to the conduct of the catching, taking, harvesting, cultivating, 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 including employment in or necessary to the conduct of the loading, unloading or packing of such products for shipment or in propagating, processing (other than canning), marketing, freezing, curing, storing, or distributing the above products or byproducts thereof; or . . ." On page 22, line 1, after the words "employed in" insert the words "or necessary to the conduct of . . ." The amendment was ordered to lie on the table and be printed.

On August 18, 1960, the Senate passed with a amendment H. R. 12677, after substituting for its text the amended language of S. 3758, companion bill. Prior to this action, the Senate considered

several amendments to S. 3758, some of which were accepted. The Senate insisted on its amendments, asked for conference, and appointed conferees. S. 3758 was indefinitely postponed. The general fishery exemption for processing in the present law has not been retained in the Senate version of H. R. 12677. But the House version does retain the fishery exemption, for both fishing and processing activities. No action was taken on the Stennis amendment submitted on August 12, 1960.

Regarding a request in the House to send to conference H. R. 12677, one objection was voiced and the bill was passed over on August 23, 1960. On August 24 the House Committee on Rules deferred action on a rule to send the bill to conference.

On August 25, 1960, the House Committee on Rules granted a rule to take H. R. 12677 from the Speaker's table and send it to conference. The same day Smith from the Committee on Rules reported to the House H. Res. 624, providing for sending to conference H. R. 12677 (H. Rept. No. 2156). The resolution was adopted by the House by a voice vote, and the Speaker appointed conferees. The conferees then met in executive session to resolve the differences between the Senate- and House-passed versions of H. R. 12677, but did not reach agreement. H. R. 12677 passed the House June 30, 1960, and the Senate August 18, 1960.

WATER RESOURCES: The Senate Select Committee on National Resources met in executive ses-

sion August 12, 1960, and approved an outline on the basis of which the staff will prepare a draft of the committee's report on problems of national water resources. This report will be acted on by a subcommittee after the sine die adjournment of Congress.

National Water Resources (Hearings before the Select Committee on National Water Resources, United States Senate, 86th Congress, Second Session, pursuant to S. Res. 48, May 24, 25, and 26, 1960. Part 22), 332 pp., 1 map, printed. Contains statements, resolutions, letters, and reports of various cooperators, organizations, and Federal Government and state officials in favor of a unified national water policy.

National Water Resources (Hearings before the Select Committee on National Water Resources, United States Senate, 86th Congress, Second Session, pursuant to S. Res. 48, May 26, 1960. Part 23), 240 pp., 1 map, printed. Contains statements and reprints of articles in favor of the Federal Government assisting in the development of our national water resources.

National Water Resources (Index to Hearings before the Select Committee on National Water Resources, United States Senate, 86th Congress, Second Session, pursuant to S. Res. 48. Index to Parts 1-23), 48 pp., printed. Contains an alphabetical list of people who appeared before the hearings, as well as lists of charts, graphs, maps, and tables that were presented.



FOOD ADDITIVES AMENDMENT DEALS WITH PROBLEM OF UNTESTED CHEMICALS IN FOODS

"The problem of untested or questionable chemicals in food is one of extreme importance, and the Food Additives Amendment is designed to deal squarely with this problem," said Dr. K. L. Milstead on May 3, 1960, in discussing the new amendment to the Federal Food, Drug and Cosmetic Act at the National Fisheries Institute convention at Miami Beach, Fla. Milstead is Director of the Division of Regulatory Management, Bureau of Enforcement, Food and Drug Administration, U. S. Department of Health, Education and Welfare.

Under the Food Additive Amendment, which became fully effective on March 6, 1960, only those substances "generally recognized to be safe" and appearing on the so-called "white lists" may be an acceptable ingredient, Milstead told over 800 fishery executives.

"We have refused all entries into this country of fish that contain nitrites and several seizures have been made of products that were originally exported from Canada or Nova Scotia," said Milstead, in citing an example of action taken under the amendment. "However, there apparently has been very little use of sodium nitrite in this country for preservation of fresh or frozen fish."



CHART 1 - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds

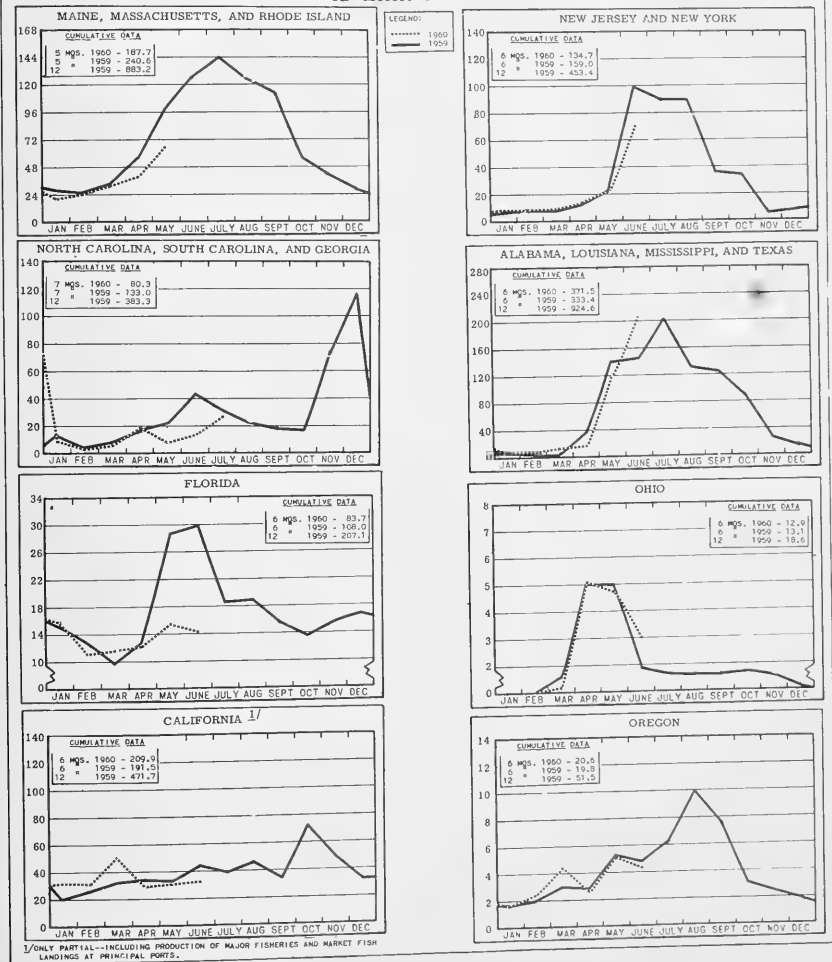
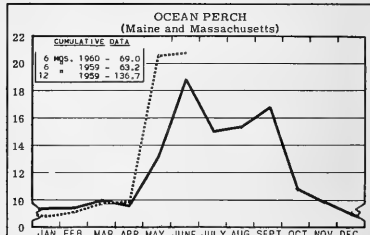
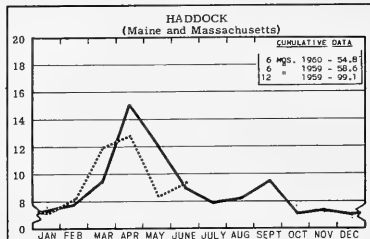
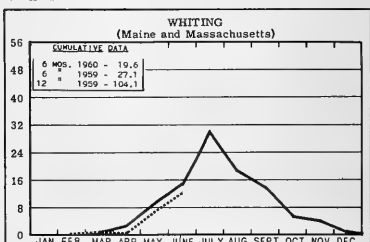
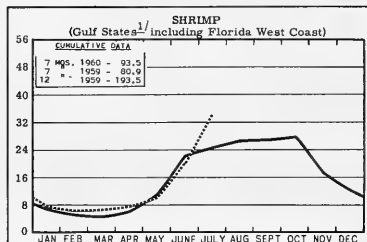


CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

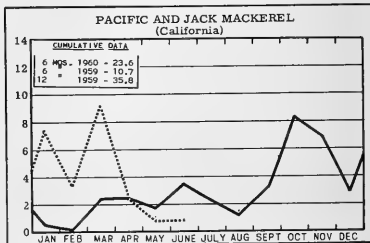
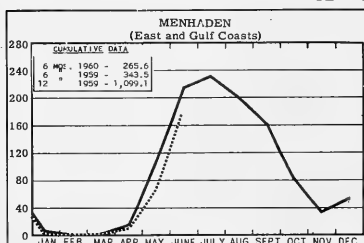


In Millions of Pounds



^{1/2}LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

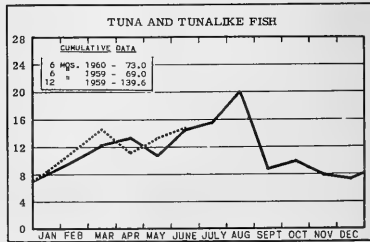
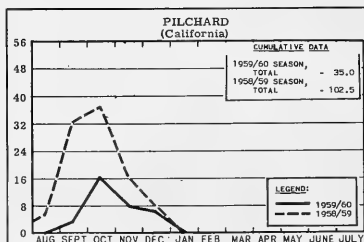
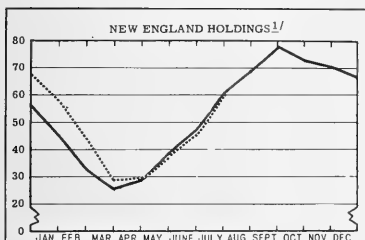
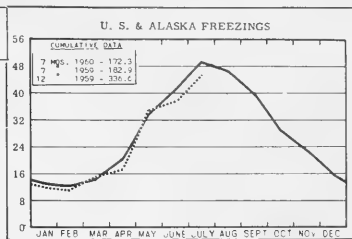
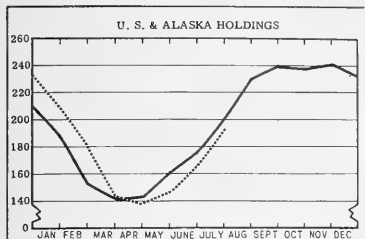
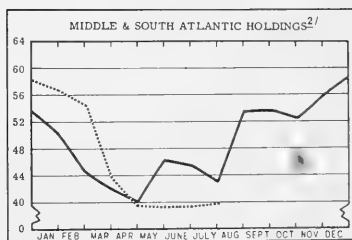


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

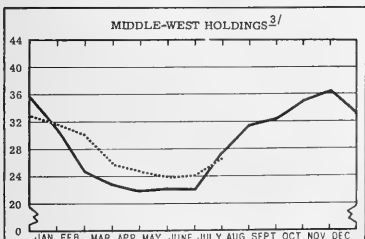
In Millions of Pounds



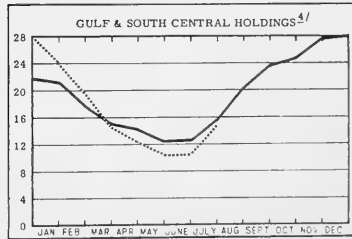
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



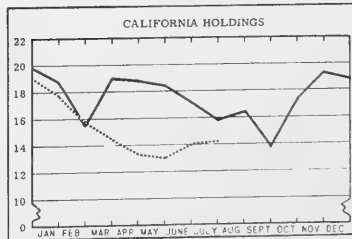
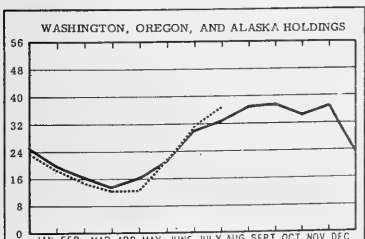
^{2/}ALL EAST COAST STATES FROM N. Y. SOUTH.



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



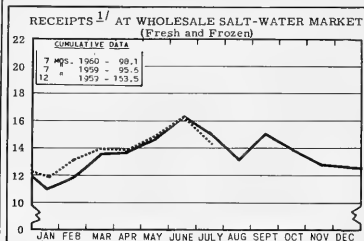
^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.



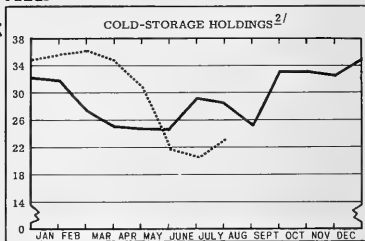
* Excludes salted, cured, and smoked products.

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

In Millions of Pounds

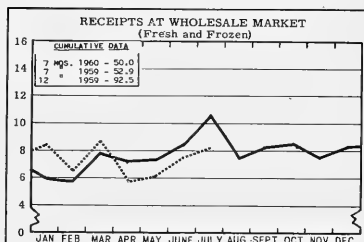


NEW YORK CITY

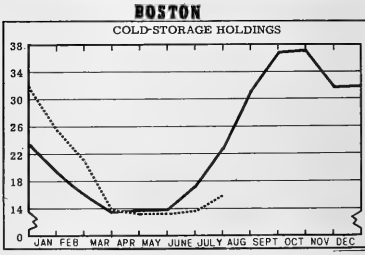
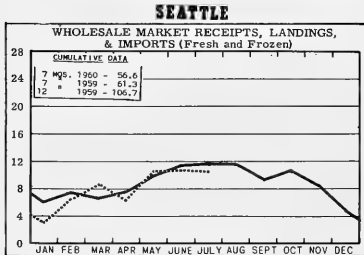
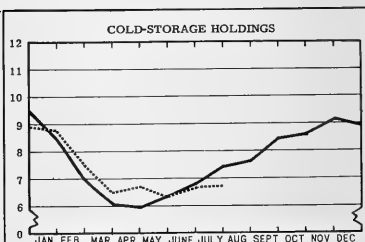


^{1/}INCLUDES TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



LEGEND:
 ***** 1960
 ————— 1959

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

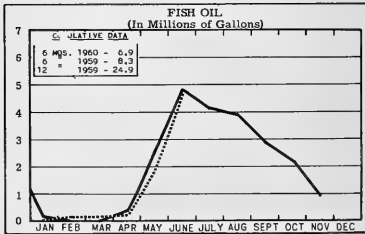
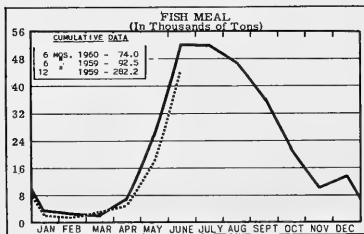
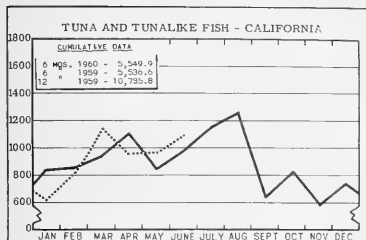
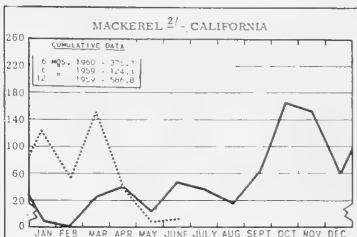


CHART 6 - CANNED PACKS OF SELECTED FISHERY PRODUCTS

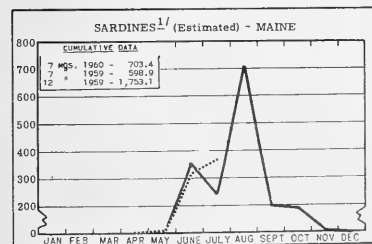
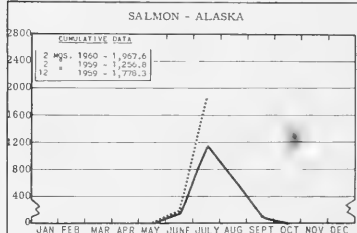
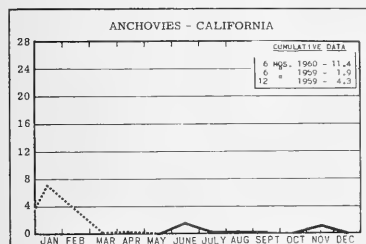
In Thousands of Standard Cases



LEGEND:
..... 1960
———— 1959



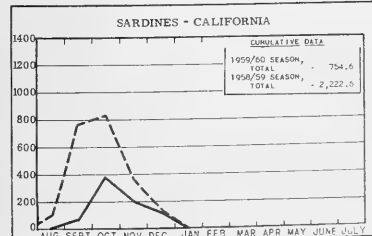
^{2/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	1/2 drawn	3 1/2 oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# 1/2 tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	1/2-lb.	8 oz.



LEGEND:
———— 1959/60
----- 1958/59

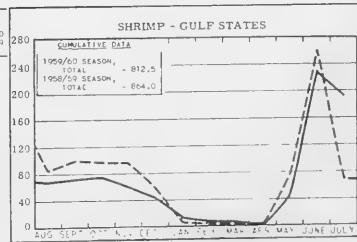
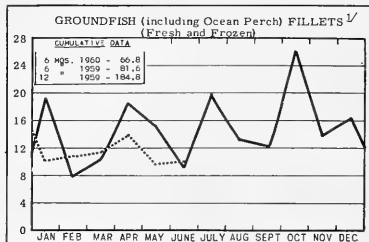
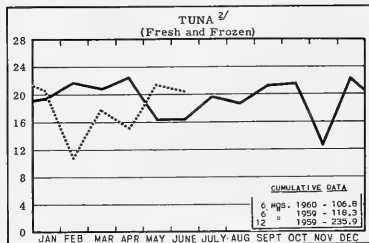
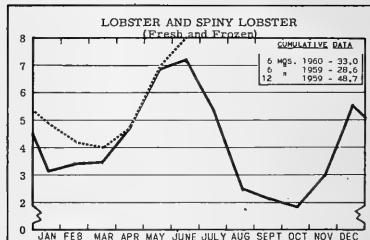
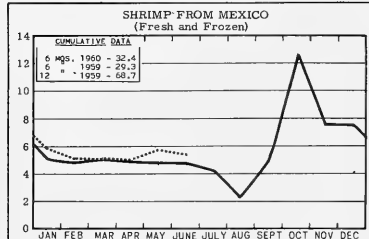
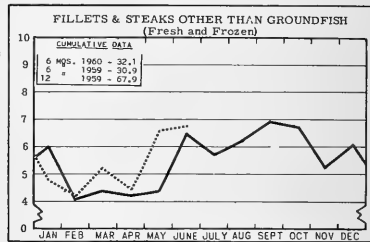


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

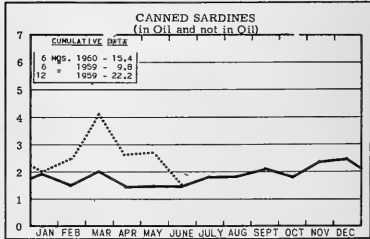
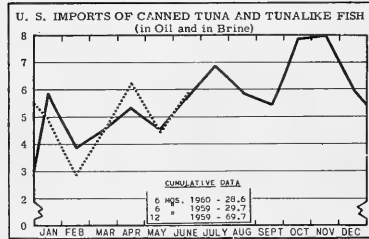
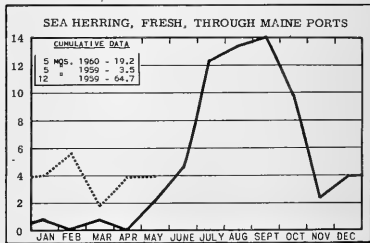
In Millions of Pounds



^{1/} SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1950.



^{2/} EXCLUDES LOINS AND DISCS.





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.
 SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
|----------|---|
| CFS-2260 | - Massachusetts Landings, 1959 Annual Summary, 13 pp. |
| CFS-2291 | - Shrimp Landings, 1959 Annual Summary, 22 pp. |
| CFS-2315 | - Massachusetts Landings, February 1960, 5 pp. |
| CFS-2319 | - Maryland Landings, April 1960, 3 pp. |
| CFS-2327 | - New York Landings, April 1960, 4 pp. |
| CFS-2328 | - Florida Landings, April 1960, 7 pp. |
| CFS-2329 | - Maine Landings, April 1960, 3 pp. |
| CFS-2330 | - Shrimp Landings, February 1960 6 pp. |
| CFS-2332 | - Rhode Island Landings, April 1960, 3 pp. |
| CFS-2333 | - Mississippi Landings, March 1960, 2 pp. |
| CFS-2334 | - California Landings, February 1960, 4 pp. |
| CFS-2337 | - California Landings, March 1960, 4 pp. |
| CFS-2335 | - Texas Landings, April 1960, 3 pp. |
| CFS-2338 | - Frozen Fish Report, May 1960, 8 pp. |
| CFS-2339 | - Alaska Fisheries, 1959 Annual Summary, 8 pp. |
| CFS-2340 | - Ohio Landings, April 1960, 2 pp. |
| CFS-2341 | - New Jersey Landings, May 1960, 3 pp. |
| CFS-2342 | - Massachusetts Landings, March 1960, 5 pp. |
| CFS-2343 | - South Carolina Landings, May 1960, 2 pp. |
| CFS-2344 | - Shrimp Landings, March 1960, 6 pp. |
| CFS-2345 | - Virginia Landings, May 1960, 4 pp. |
| CFS-2346 | - North Carolina Landings, May 1960, 3 pp. |
| CFS-2347 | - Mississippi Landings, April 1960, 2 pp. |
| CFS-2349 | - Florida Landings, May 1960, 7 pp. |
| CFS-2350 | - Georgia Landings, May 1960, 2 pp. |
| FL-28 | (Revised January 1960)-Fish Baits, Their Collection, Care, Preparation, and Propagation, 27 pp., illus. |

- FL-46 (Revised March 1960)-Dealers in Trout and Pondfishes 33 pp.
- FL-132 - Structure and Senses of Fishes, by Ralph Hile, 13 pp., illus., March 1960.
- FL-191 - Wholesale Dealers and Producers of Bait Fish, 27 pp., March 1960.
- FL-195 (Revised October 1959) - Partial List of Manufacturers of Fishing Gear and Accessories and Vessel Equipment, 27 pp.
- FL-366 (Revised December 1958) - Recognizing Important Shrimp of the South, by William W. Anderson, 7 pp., illus.
- FL-403 (Revised January 1960) - Fish and Wildlife Regulations for District of Columbia, 4 pp.
- FL-489 - Haddock, by Albert C. Jensen, 9 pp., illus., March 1960. Describes the habits, growth, age determination, commercial fishery, utilization, and research on the haddock (*Melanogrammus aeglefinus*). The haddock is one of the most important food fishes in the North Atlantic, where they are caught principally by otter trawlers and long-liners. In 1958, haddock ranked second in volume and value in the New England fishery.
- FL-490 - Sponges, by Paul S. Galtsoff, 18 pp., illus., March 1960. Discusses the widespread occurrence of sponges, their reproduction and regeneration, sponges of commerce, sponge cultivation, preparation for market, sale of sponges, fungus disease, and artificial sponges. A variety of photos and sketches add interest to the leaflet.
- FL-491 - Sea Lamprey, by Lola T. Dees, 8 pp., illus., March 1960. Discusses the effects of lamprey attacks on the Great Lakes trout fishery; cooperative research on its control; natural history--spawning, larval and adult forms. Also discusses efforts to find commercial uses for the lampreys to compensate for the destruction they cause; mechanical, electrical, and chemical controls; and restoration of the lake trout resources.
- FL-493 - The Bluefin Tuna-Trap Fishery of the Western Mediterranean Sea, by J. R. Thompson, 13 pp., illus., January 1960. Discusses the natural history of the bluefin tuna (*Thunnus*

thynnus); size and composition of trap catches; trap gear--placement, discription, and construction details; and trap operation. Included are a map of the area and diagrams of the trap.

FL-495 - Sea Horses, by Lola T. Dees, 9 pp., illus., April 1960. Describes the sea horse, the most unfishlike fish; its appearance, habits, reproduction, young, enemies, self-protection, culture, and value. The most unique characteristic of the sea horse is its manner of reproduction; the male bears the young. Of no commercial value as food, the sea horse is highly-prized as a curio.

Wholesale Dealers in Fishery Products (Revised):

SL- 2 - New Hampshire, 1959.
SL- 6 - New York Coastal Area, 1959.
SL- 9 - Delaware, 1959.
SL- 12 - Virginia, 1959.
SL- 16 - Florida, 1959.
SL- 19 - Louisiana (Coastal Area), 1959.
SL- 20 - Texas (Coastal Area), 1959.
SL- 22 - Oregon, 1959.
SL- 23 - Washington, 1959.
SL- 30 - Pennsylvania (Great Lakes Area), 1959.

Firms Canning, 1959 (Revised):

SL-103 - Tuna.
SL-103A- Tunalike Fishes.
SL-105 - Alewives.
SL-106 - Shad.
SL-109 - Caviar and Fish Roe.
SL-110 - Oysters.
SL-112 - Shrimp.
SL-113 - Crab Meat.
SL-119 - Squid.
SL-120 - Anchovies.

Firms Manufacturing, 1959 (Revised):

SL-151 - Fish Meal, Scrap, and Body Oil.
SL-151A-Fish Solubles and Homogenized Condensed Fish.
SL-153 - Fish Glue.
SL-156 - Pearl Essence.
SL-157 - Liver and Viscera Oil.
SL-159 - Fresh-Water Mussel-Shell Products.

SSR-Fish. No. 313 - Physical Oceanographic, Biological, and Chemical Data--South Atlantic Coast of the United States, Gill Cruise 9, by William W. Anderson and Jack W. Gehringer, 231 pp., illus., September 1959.

SSR-Fish. No. 320 - Development and Operation of Television for Studying Fish Behavior in Otter Trawls, by John R. Clark, Robert Livingstone, Jr., and James M. Crossen, 25 pp., illus., December 1959.

SSR-Fish. No. 321 - Herring Spawning Surveys in Southeastern Alaska, by Bernard Einer Skud, 20 pp., illus., December 1959.

SSR-Fish. No. 323 - Indices of Mean Monthly Geostrophic Wind Over the North Pacific Ocean, by Laurence E. Eber and Oscar E. Sette, 112 pp., illus., September 1959.

SSR-Fish. No. 326 - Zooplankton Volumes off the Pacific Coast, 1957, by James R. Thrailkill, 60 pp., illus., November 1959.

SSR-Fish. No. 331 - The Eastern Hokkaido Land-Based Salmon Fishery of Japan, by Lorry M. Nakatsu, 13 pp., illus., March 1960.

SSR-Fish. No. 335 - Fish Marketing and Consumption in the Pacific Coast States, by S. Kent Christensen and Russell M. Boshell, 188 pp., December 1959. A comprehensive survey of the marketing and consumption of fresh, frozen packaged, and smoked fish and shellfish in California, Oregon, and Washington. Consumer purchases and preferences for salmon, halibut, sole, rockfish, and crab in these forms are examined in detail. For example, household purchases of fresh fish and shellfish of these species are analyzed by areas within the states, by income and factors associated with income such as occupation, and education, by region of prior residence and duration of residence on the Pacific coast, by religious groups, and by retail outlet where these products were last purchased. Similar analyses are made of the household purchases of frozen packaged and smoked fish and shellfish. The retail distribution of fresh fish and shellfish in the Pacific Coast States is examined with special emphasis on the major problems confronting the retailers handling these products. The selling practices of retailers who stock frozen packaged fish are presented in some detail because of the large percentage of retail stores involved. A limited analysis is made of the retail distribution of smoked fishery products. The examination of the wholesale distribution of the fishery products included in the study is concerned with the type of wholesalers and type of product, the services offered to retailers, the storage facilities used by wholesalers, and their suggestions and opinions in connection with product improvement and promotion. A series of recommendations based on the study are presented. The important areas covered include: consumer education; retailer and wholesaler education; service improvement; and products improvement.

SSR-Fish. No. 337 - The Application of Paper Chromatography in Identifying Tuna Larvae, by Walter M. Matsumoto, 13 pp., illus., January 1960.

SSR-Fish. No. 342 - A Census of the California Gray Whale, by Raymond M. Gilmore, edited by Dale W. Rice, 34 pp., illus., May 1960. There are two distinct populations of living gray whales: one known as the California population, in the eastern North Pacific; the other, known as the Korean population, in the western North Pacific. A third population, now extinct, occupied the eastern North Atlantic. The present study concerns only the California population. The main objectives of this study were to (1) estimate the size of the total population and its present rate of increase, (2) determine the extent of the breeding grounds and their relative importance,

(3) determine the time and nature of the southward migration past California, and (4) establish a basis for detecting, in the future, any unusual changes in population size.

Sup. No. 596 - Control of Iron Sulfide Discoloration in Canned Shrimp (*Xiphopeneus* sp.) - Part I.

Sup. No. 597 - Construction and Operation of an Inexpensive Fish Smokehouse.

Frozen Processed Fish and Shellfish Consumption in Institutions and Public Eating Places. A series of reports on a survey of frozen processed fish and shellfish consumption in institutions and public eating places in ten cities, were issued in November 1959. This study was conducted in order to obtain information which could be used by the fishing industry to increase consumer demand for fishery products. The data collected should be useful in helping processors of frozen fish, shellfish, and portions to adjust their operations and services in order to reduce costs, provide better services, and develop new or expanded markets. Circular 66 explains the purpose of the study, survey methods and procedures, and reliability of study results. Circulars 67-76 contain data obtained for each city as a result of this survey. All of these circulars are available under the series title of "Frozen Processed Fish and Shellfish Consumption in Institutions and Eating Places."

Cir. 66 - Survey Methods and Procedures, 24 pp.

Cir. 67 - Atlanta, Georgia, 56 pp.

Cir. 68 - Chicago, Illinois, 64 pp.

Cir. 69 - Cleveland, Ohio, 52 pp.

Cir. 70 - Denver, Colorado, 54 pp.

Cir. 71 - Houston, Texas, 51 pp.

Cir. 72 - Los Angeles, California, 66 pp.

Cir. 73 - New York, New York, 61 pp.

Cir. 74 - Omaha, Nebraska, 52 pp.

Cir. 75 - Portland, Oregon, 53 pp.

Cir. 76 - Springfield, Massachusetts, 50 pp.

Bureau of Sport Fisheries and Wildlife Pesticide-Wildlife Review, 1959, by James B. DeWitt and John L. George, Circular No. 84, 41 pp., illus., January 1960. Discusses the scope of the pesticide-wildlife problem; reviews the current activities and findings of the Bureau of Sport Fisheries and Wildlife, cooperators, and others in this field; summarizes the legislative developments of the past few years; and gives the Bureau's recommendations for use of pesticides with minimum harm to wildlife.

Progress in Sport Fishery Research, 1959, Fish and Wildlife Circular 81, 83 pp., illus., 1960.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-6a	- Mexico's Fish and Shellfish Canning Industry, 1959.
MNL-7a	- Mexican Fisheries, 1959.
MNL-8a	- Portuguese Fishing Industry, 1959.

MNL-20 - Angola's Fishing Industry, 1959.

MNL-21 - South West Africa's Fisheries, 1959.

MNL-22 - Union of South Africa's Fisheries, 1959.

MNL-23 - Fisheries of Chile.

MNL-24 - Mexican Fish Meal Plants.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

(Baltimore) Monthly Summary - Fishery Products, February 1960, 10 pp. (Market News Service, U. S. Fish and Wildlife Service, 400 E. Lombard St., Baltimore 2, Md.) Receipts at Baltimore by species and by states and provinces for fresh- and salt-water fish and shellfish; total receipts by species and comparisons with previous years; and wholesale prices on the Baltimore market; for the month indicated.

California Fishery Products Monthly Summary, May 1960; 13 pp. each. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg, San Pedro Calif.) California Cannery receipts of tuna and tunalike fish, mackerel, and anchovies; pack of canned tuna, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the month indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, May and June 1960, 13 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the months indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, May 1960, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish on the New Orleans French Market; sponge sales; and imports at Port Isabel and Brownsville, Tex., from Mexico; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, June 1960, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, May 1960, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier,

Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for May 1960, 17 pp. (Market News Service, 155 John St., New York 38, N.Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, May and June 1960, 9 and 11 pp. respectively. (Market News Service, U.S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.), wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the months indicated.

Effects of Turbidity-Producing Materials in Sea Water on Eggs and Larvae of the Clam, VENUS (MERCENARIA) MERCENARIA, by Harry C. Davis, 7 pp., illus., printed. (Reprinted from Biological Bulletin, vol. 118, no. 1, February 1960, pp. 48-54.) U.S. Bureau of Commercial Fisheries, Biological Laboratory, Milford, Conn.

Use of Chemicals to Control Shellfish Predators, 2 pp., printed. (Reprinted from Science, vol. 131, no. 3412, May 20, 1960, pp. 1522-1523.) U.S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Biological Laboratory, Milford, Conn.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM MARINE MAMMAL RESEARCH, U.S. FISH AND WILDLIFE SERVICE, SAND POINT NAVAL AIR STATION, SEATTLE, WASH.

Aquarial Observations on Feeding of Kamchatka Crab, by D. N. Logvinovich, 19 pp. (Translated by Leda V. Sagan from Vladivostok, Izvestia Tikhookeanskogo N.-I. Instituta Rybongo Khoz-iaistva i Okeanografi, vol. 19, 1945, pp. 79-97.)

Lipids of the Muscle of Tuna, THYNNUS ORIENTALIS. IV--Cephalins of the Dark-Colored and Ordinary Muscles, by Hisanao Igarashi, Koicha Zama, and Muneo Katada, 4 pp. (Translated by

George Kudo from the Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 5, 1957, pp. 278-281.)

Using Results of Calculating the Growth Rate of Atlantic and Scandinaian Herrings for Distinguishing Schools and for Studying Migration Routes, by N. P. Biriukov, 8 pp. (Translated by Leda V. Sagan from Voprosy Ikhtiologii, no. 6, 1956, pp. 47-54.)

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, BIOLOGICAL LABORATORY, SEATTLE, WASH.

Data on Salmon Predation:

- (1)-On Predation on Salmon by Fur Seals, by Hokuyo Bosen Kyogi Kai (North Pacific Mothership Association), 5 pp., in Japanese, March 15, 1959. (Complete Translation by Hack Chin Kim.)
- (2)-Predation on Salmon by Harbor Seal and Sea Lions, by Kozo Ikeyama, 7 pp. (Translated by Hack Chin Kim from Suisankai--Journal of the Fisheries Society of Japan--February 1935.)
- (3)-Predation on Salmon by Belugas, Dolly Varden and Mackerel Sharks, by Hokuyo Bosen Kyogi Kai (North Pacific Mothership Association), 25 pp., March 15, 1959. Consists of summary translations in Japanese of Russian articles: "The Belugas Whose Main Food is Salmon," by A. G. Tomilin; "Measures for Increasing Far Eastern Salmon Stocks," by K. I. Popov; and "Miscellaneous Information on Predation on Various Far Eastern Salmon Species," by G. V. Nikolsky. Also contains "Notes on the Salmon Shark as a Predator of Salmon (Oncorhynchus sp.) in the North Pacific Ocean," by Osamu Sano. (Summary translations in English by Hack Chin Kim.)
- (4)-On Predation on Salmon by Fur Seals and Harbor Seals, by Hokuyo Bosen Kyogi Kai (North Pacific Mothership Association), 6 pp., illus., (Summary translation by Hack Chin Kim.)

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

Definition of Haddock Stocks of the Northwestern Atlantic, by John R. Clark and Vadim D. Vlad- ykov, Fishery Bulletin 169 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), pp. 283-296, illus., printed, 20 cents, 1960. Vertebrae of haddock from 16 fishing grounds in the northwestern Atlantic were counted to determine whether such counts could be used to identify population units. Comparison of average numbers of vertebrae from the different areas showed significant differences, which could be related to surface water temperatures on the grounds during the spawning time. The relationship is consistent with that developed for northeastern Atlantic haddock from published European data. Age data which were available for the samples from Georges and Browns Banks demonstrated that the differences in average vertebral numbers among the individual year classes on each bank could be attributed

to differences in temperatures in the spawning period in different years. Consideration of average vertebral numbers of the various population units suggests the following as major haddock stocks of the northwestern Atlantic: Newfoundland; eastern, central, and western Nova Scotia, and New England.

"Techniques for Studying Herring Scales and Otoliths," by Charles M. Larsen and Bernard E. Skud, article, *Progressive Fish-Culturist*, vol. 22, no. 2, April 1960, pp. 85-86, illus., printed, 25 cents. This paper describes (1) a technique for mounting and photographing Atlantic herring (*Clupea harengus*) scales and (2) a technique for clearing and photographing herring otoliths. By using these methods of handling and mounting scales and otoliths, clear large prints may be obtained directly with a photographic enlarger. This provides a rapid, efficient, and inexpensive procedure for the examination of scales and otoliths for racial as well as age and growth studies.

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.

ADVERTISING:

Advertising for Profit and Prestige, by D. Peter Bowles, *Small Marketers Aids* No. 56, 4 pp., printed. *Small Business Administration*, Washington 25, D.C., June 1960.

ALASKA:

Regulations of the Alaska Board of Fish and Game for Commercial Fishing in Alaska, 95 pp., printed. Alaska Department of Fish and Game, 229 Alaska Office Bldg., Juneau, Alaska, 1960. Contains definitions of terms used in the regulations, and outlines provisions for commercial fishing in Alaska and international waters. The general provisions section discusses regulations such as license requirements for fishermen, vessels, and gear; reports from operators; inspection of fishery establishments; prohibition of explosives, chemicals, and poisons; salmon, bottom fish, smelt, herring, shellfish, whitefish, sheefish, and char fisheries requirements; subsistence fishery provisions; and emergency regulations.

ALGAE:

"Chemical Studies on Marine Algae. XII--The Free Amino Acids in Several Species of Marine Algae," by Mitsuzo Takagi and Mitsuo Kuriyama, article, *Bulletin of the Faculty of Fisheries, Hokkaido University*, vol. 10, May 1959, pp. 72-76, printed in English. *Bulletin of the Faculty of Fisheries, Hokkaido University, Hokkaido University, Hokodate, Japan.*

"Pourquoi Garder le Silence sur les Algues Marines et Leurs Mille Emplois?" (Why Keep Silent About the Marine Algae and Its Thousand Uses?), article, *France Peche*, vol. 50, no. 40, May 1960, pp. 17-21, illus., printed in French. *France Peche*, 84 Rue Carnot, Lorient, France.

ANTIBIOTICS:

Antioxidant for Fish, by Eitaro Tsuboi and Takayuki Tsuboi, Japanese Patent Number 2832, April 22, 1959, printed in Japanese. Japanese Patent Office, Tokyo, Japan.

"Antioxidant Treatment of Rainbow Trout," by F. Bramsnaes, H. Brennum, and H. Sorensen, article, *Bulletin de L'Institut International du Froid*, vol. 39, 1959, p. 894, printed. International Institute of Refrigeration, 177 Boulevard Maiesherbes, Paris 17, France.

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"Permits Deep-Fat Browning Without Deep-Fat Methods," article, Food Processing, vol. 20, April 1959, p. 81, printed. Food Processing, Putnam Publishing Company, 111 E. Delaware Pl., Chicago, Ill. Infrared cooking of fish sticks permits deep-fat browning without deep-fat cooking methods. Only small amounts of oil are sprayed on fish sticks during cooking operation. A 7-foot long infrared oven is turning out approximately 400 pounds of processed fish sticks are properly browned and cooked before being frozen.

FISH TRANSPORTATION:

The Control of pH by Buffers in Fish Transport, by William N. McFarland and Kenneth S. Norris, 20 pp., illus., printed. (Reprinted from California Fish and Game, October 1958, pp. 291-310). California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif. The heavy fishing pressure on our Nation's streams and lakes requires large-scale propagation and planting of fish, and has led to the development of the complex modern fish tanks. One of the major problems confronting the fisheries biologist has been the development of better means of transporting live fish. This study has been separated into two parts: first, the practical aspects of buffer application to live fish transport in water; and second, the theoretical and experimental background underlying the practical methods. In summary, the authors state that "Chemical buffers are of importance in the control of acidity changes during fish transport, resulting from respiration and accumulation of waste products. A biochemical buffer, tris-hydroxymethyl-aminomethane, has been found valuable for pH control, both in closed and open-system fish transport. Inorganic buffers either caused heavy precipitation of salts in sea water or buffered outside the optimum pH range for marine fish." Methods of application in transport are discussed.

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Hydrographic Data from the Inshore Bays and Estuaries of Everglades National Park, Florida, 1957-1959, by Durbin Tabb, David Dubrow, and Raymond Manning, 26 pp., illus., processed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla.

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"L'Evolution de Notre Industrie Thoniere" (The Development of Our Tuna Industry), by L. Ploas, article, La Peche Maritime, vol. 39, no. 986, May 1960, pp. 268-269, printed in French. La Peche Maritime, 190 Blvd. Haussman, Paris, France.

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345 pp., illus., printed. Washington State Department of Fisheries, Seattle, Wash., February 1960. Comprises revised editions of volumes I and II, plus several new chapters. An excellent text for fisheries students, this volume is also of vital interest to members of the fisheries and allied industries. Covers, with the aid of many fine photos, charts, and drawings, every aspect of development and conservation of fish and shellfish resources in the State of Washington. Its 22 chapters include material on fisheries of the Columbia River Basin, oyster and clam farming, pollution and predator control, the salmon fisheries, international fisheries, and many other pertinent topics.

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HARPOONS:

"A Proposito di un Arpione Rinvenuto su un Tonno Pescato in Tunisia e Descritto de Heldt nel 1932--Arpioni in Uso Nello Stretto di Messina" About a Harpoon Found in a Tuna Caught in Tunisia and Described by Heldt in 1932--Harpoons Used in the Messina Strait), by Pasquale Arena, article, Bollettino di Pesca, Piscicoltura e Idrobiologia, vol. 35, no. 14, January-June 1959, pp. 95-99, illus., printed in Italian with English summary. Istituto Poligrafico Dello Stato,

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Rome, Italy. About a Harpoon found in a tuna caught in Tunisia and described by Heldt in 1932. In comparison with this recovery, the author describes the harpoons used in the Messina Strait in Swordfish and tuna fishing, in order to establish the tuna's identity and place of origin.

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"L'Avenir de la Peche du Hareng" (The Future of the Herring Fishery), article, La Peche Maritime, vol. 39, no. 987, June 1960, pp. 335-336, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris 8^e, France.

"Chemical Studies on the Herring (Clupea harengus), II--The Free Amino-Acids of Herring Flesh and Their Behavior During Post-Mortem Spoilage," by R. B. Hughes, article, Journal of the Science of Food and Agriculture, vol. 10, October 1959, pp. 558-564, printed. Journal of the Science of Food and Agriculture, Society of Chemical Industry, 14 Belgrave Square, London, S.W. 1, England.

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"A Specific Gravity Method for Determining Fitness (Condition) in Herring (Clupea pallasii)," by Albert Tester, article, Journal of the Fisheries Research Board of Canada, vol. 4, February 1940, pp. 461-471, printed. Fisheries Research Board of Canada, Ottawa, Canada.

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INDONESIA:

"Indonesia," by Soepanto Koesoemowinoto, article, Pacific Fisherman, vol. 58, January 25, 1960, pp. 153-154, printed. Pacific Fisherman, 500 Howard St., San Francisco 5, Calif. Building the industry, providing credit for fishermen, improving marketing, and carrying out research are the topics discussed.

IRRADIATION PRESERVATION:

Food Preservation by Irradiation (Supplement to CTR-357), OTS Selective Bibliography, 5 pp., processed, 10 cents. Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C., March 1960. A bibliography of reports listed in the two OTS monthly abstract journals: U. S. Government Research Reports and Technical Translations. Includes publications on various aspects of irradiation preservation of food by the Atomic Energy Commission, other research organizations, and various foreign agencies.

ITALY:

Statistica della Pesca e della Caccia, 1959 (Fishing and Hunting Statistics, 1959), 160 pp., illus., printed in Italian. Istituto Centrale di Statistica, Rome Italy, 1959.

LATIN AMERICA COMMON MARKET:

Progress Report by the Secretariat on the Common Market Programme, E/CN. 12/AC. 45/3, 45 pp., processed. Distribution and Sales Section, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, March 15, 1960, limited distribution. A report presented at the Seventh Session, Committee of the Whole, Economic Commission for Latin America, at Santiago, Chile, March 28, 1960. Discusses plans and accomplishments of this UNESCO Commission to establish the Latin American Common Market and the Latin American Free-Trade Association. Reports on the Montevideo Treaty February 18, 1960, establishing the Latin American Free-Trade Association, signed by Argentina, Brazil, Chile, Mexico, Paraguay, Peru, and Uruguay. The text of the Treaty is included as an annex to the report.

LEMON SOLE:

"The Relation of Stock Density to 'Milkiness' of Lemon Sole in Union Bay, B. C.," by C. R. Forrester, article, Progress Reports of the Pacific Coast Stations, no. 105, February 1956, p. 11, printed. Fisheries Research Board of Canada, Pacific Fisheries Experimental Station, 898 Richards St., Vancouver, B. C., Canada.

MARINE ALGAE:

"New Records of Marine Algae from Pacific Mexico and Central America," by E. Yale Dawson, article, Pacific Naturalist, vol. 1, no. 20, June 6, 1960, pp. 31-52, illus., printed. Beaudette Foundation for Biological Research, Box 482, R.F.D. 1, Solvang, Calif.

"Potential Productivity of the Sea," by John H. Ryther, article, Science, vol. 130, September 11, 1959, pp. 602-608, printed. American Association for the Advancement of Science, 1515 Massachusetts Ave., N. W., Washington 5, D. C.

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MARINE PLANTS:

"New Records of Sublittoral Marine Plants from Pacific Baja California," by E. Yale Dawson, Michael Neushul, and Robert D. Wildman, article, Pacific Naturalist, vol. 1, no. 19, June 6, 1960, pp. 3-30, illus., printed. Beaudette Foundation for Biological Research, Box 482, R.F.D. 1, Solvang, Calif.

MARKETING:

Economic Inquiry into Food Marketing. Part 1--Concentration and Integration in Retailing, 354 pp., printed, \$1.25. Federal Trade Commission, Washington, D. C., January 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) A staff report on economic concentration and integration in the retail sale of food, which completes the first phase of the Commission's economic study of food marketing. The report emphasizes the growing influence of the corporate chains and the decline of the independent grocer. It concludes, however, that retailer-owned cooperatives and wholesaler-sponsored "voluntary groups" of retailers "have shown a capacity for effective competition with the corporate chains." Almost 70,000 food retailers were members of either cooperatives or voluntary groups in 1958, and their combined share of total national food sales was estimated at about 33 percent, compared with 38 percent for corporate chains. The chains increased their share of total food sales in 15 metropolitan areas from 29 percent in 1948 to 44 percent in 1958. Retailer-owned cooperative member stores increased their share from 8 to 19 percent; the voluntary group stores from 5 to 12 percent; but the unaffiliated retailers dropped from 58 to 25 percent during this period. The report also deals with other important changes which have occurred in food retailing and distribution. These changes include (1) a higher degree of processing by food manufacturers, which has materially lightened the homemaker's job; (2) improvements in transportation, handling, food preserving, and distribution methods generally; (3) a continuing shift from separate meat, produce, and grocery stores to one-stop food stores; (4) replacement of smaller stores by supermarkets, expansion in size, equipment, and number of items carried by supermarkets, and location of supermarkets in new shopping centers; and (5) the spread of self-service throughout food retailing. Included are a number of statistical tables showing various aspects of retail store operation.

NAVIGATION:

United States Coast Pilot 4--Atlantic Coast, Cape Henry to Key West, Sixth (1959) Edition, 181 pp., printed, \$2.50. U. S. Department of Commerce, Coast and Geodetic Survey, Washington 25, D. C., 1960. This edition contains chart, diagrams, describing charts available for various areas;

general information; and Federal navigation regulations of most importance to these areas. Also included are chapters describing the geographical features, aids to navigation, and other information pertaining to the coast from Cape Henry to Key West; the charts pertaining to eight areas in this region; and features and facilities of the Atlantic Intracoastal Waterway.

NUTRITION:

"The Effect on Human Serum-Lipids of a Dietary Fat Highly Unsaturated But Poor in Essential Fatty Acids," by E. H. Ahrens, Jr., and others, article, The Lancet, January 17, 1958, pp. 115-119, printed. The Lancet, 7 Adams St., Adelphi, London W.C. 2, England

"Nahrvertabelle fur Fische und Fischwaren" (Table of Nutritive Values of Fish and Fisheries Products), article, Allgemeine Fischwirtschaftszeitung, no. 10, March 7, 1959, p. 12, printed in German. Verlag Carl Th. Gorg, Postfach 269, Bremerhaven-F, W. Germany.

"Studies on the Distribution of Lipides in Hypercholesteremic Rats. 1--The Effect of Feeding Palmitate, Oleate, Linoleate, Linolenate, Menhaden and Tuna Oils," by James J. Peifer and others, article, Archives of Biochemistry and Biophysics, vol. 86, February 1960, pp. 302-308, printed. Archives of Biochemistry and Biophysics, Academic Press, Inc., 125 East 23rd St., New York 10, N. Y.

OCEANOGRAPHY:

"El Congreso Internacional de Oceanografia" (The International Oceanographic Congress), article, El Agricultor Venezolano, vol. 23, no. 216, January-February 1960, pp. 18-19, illus., printed. Ministerio de Agricultura y Cria, Caracas, Venezuela.

Frontiers of the Sea: The Story of Oceanographic Exploration, by Robert C. Cowen, 307 pp., illus., printed, \$4.95. Doubleday & Co., 575 Madison Ave., New York 22, N. Y., 1960. About past, present, and future of oceans and oceanographic research.

A Plastic Envelope Substitute for Drift Bottles, by F. C. W. Olson, contribution no. 44, 4 pp., printed. (Reprinted from Sears Foundation Journal of Marine Research, vol. 10, no. 2, 1951, pp. 190-193.) Oceanographic Institute, Florida State University, Gainesville, Fla.

OVERFISHING:

"La Huitieme Session Pleniere de la Commission Permanente de l'Overfishing" (The Eighth Complete Session of the Permanent Commission on Overfishing), article, La Pêche Maritime, vol. 39, no. 987, June 1960, pp. 337-338, printed in French. La Pêche Maritime, 190 Blvd. Hausmann, Paris, France.

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OYSTERS:

"An Evaluation of the Indole and Trimethylamine Tests for Oyster Quality," by Donald Lartigue, Arthur F. Novak and Ernest A. Fieger, article, Food Technology, vol. 22, February 1960, pp. 109-112, printed. Institute of Food Technologists, The Garrard Press, 510 North Hickory, Champaign, Ill.

On Oysters and Sulfite Waste Liquor, by Gordon Gunter and Jack McKee, 99 pp., illus., processed. Pollution Control Commission, 224 Old Capitol Bldg., Olympia, Wash., February 25, 1960. The purpose of this report is to recommend a course of action and appropriate water quality standards to protect oysters from any probable adverse and unreasonable effects of sulfite waste liquor in the estuarial environment. It covers the two principal species of oysters commercially important in the State of Washington, viz. Ostrea lurida, the Olympia oyster, and Crassostrea gigas, the Japanese or Pacific oyster. Other oysters, such as the varieties found on the East and Gulf Coast are covered by reference only. The report also embraces ecological factors that may influence oyster productivity and quality, with special attention to the microorganisms believed to constitute the principal food of oysters. The impacts of natural forces, as well as man-made influences are considered in relation to oyster culture. Toxicity data, both acute and long-term, are evaluated with respect to oysters and other organisms. The nature of sulfite waste liquors is described and their occurrence in the tidal estuaries of Washington is analyzed. Finally, historical background and trends in oyster production are reviewed.

PACIFIC ISLANDS:

Trust Territory of the Pacific Islands--12th Annual Report, July 1, 1958-June 30, 1959, Department of State Publication 6945, 272 pp., printed, \$1.00. Department of State, Washington 25, D.C., April 1960. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Includes a chapter on fisheries.

PERU:

Estadística Economica de la Industria Pesquera (Economic Statistics of the Fishing Industry), 161 pp., printed in Spanish. Ministerio de Agricultura, Direccion de Pesqueria y Caza, Lima, Peru, 1959.

PLAICE:

"Jellied Condition in the American Plaice Hippoglossoides platessoides (Fabricius)," by Willfred Templeman and Gertrude L. Andrews, article, Journal of the Fisheries Research Board of Canada, vol. 13, March 1956, pp. 149-182, printed. Queen's Printer & Controller of Stationery, Ottawa, Canada.

POLLUTION:

Pulp Mill Pollution in British Columbia, by Michael Waldichuk, Circular No. 57, 18 pp., illus., processed. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada, June 1960.

PORTUGAL:

Gremio dos Armadores de Navios da Pesca do Bacalhau, Relatorio e Contas do Exercício de 1959 e Orcamento para 1960 (Cod Fishing Vessel Owners' Guild, Statment of Operations for 1959 and Budget for 1960), 32 pp., printed in Portuguese. Comissao Revisora de Contas, Lisbon, Portugal, February 17, 1960.

Gremio dos Armadores da Pesca de Arrasto, Relatorio e Contas do Exercício de 1959 e Orcamento para 1960 (Trawler Owners' Guild, Statement of Operations for 1959 and Budget for 1960), 52 pp., printed in Portuguese. Comissao Revisora de Contas, Lisbon, Portugal, March 7, 1960.

Gremio dos Armadores da Pesca da Baleia, Relatorio e Contas do Exercício de 1959 e Orcamento para 1960 (Whaling Vessel Owners' Guild, Report of Operations in 1959 and Budget for 1960), 35 pp., illus., printed in Portuguese. Comissao Revisora de Contas, Lisbon, Portugal, February 15, 1960.

POULTRY NUTRITION:

"A Bioassay for Determining the Nutritional adequacy of Protein Supplements for Chick Growth," by Scott W. Hinner and H. M. Scott, article, Poultry Science, vol. 39, January 1960 pp. 176-183, printed. Poultry Science Publishers, Kansas State College, Manhattan, Kans.

"Interrelationships Among Dietary Energy, Protein, and Amino Acids for Chickens," by K. C. Leong and others, article, Poultry Science, vol. 38, November 1959, pp. 1267-1285, printed. Poultry Science Publishers, Kansas State College, Manhattan, Kans.

PRESERVATION:

"Preservation of Shrimps," by R. T. Roskam, Conserva, vol. 6, no. 11, May 1958, p. 278, parts I and 2, printed in Dutch. Conserva, Maanbald voor de Voedlings-en Genotmiddelen-Industrie, Moormans Periodiek, Pers N. V., The Hague, Netherlands.

PROTEINS:

"Biological Value of Herring-Meal Protein. Urinary Nitrogen Excretion in Relation to Protein Content of Diet and Food Intake," by L. R. Njaa. Norwegian Fisheries Research Inst., Bergen, Norway.

"Studies on the Muscle Proteins of the Squid," by Juichiro J. Matsumoto, article, Bulletin of the

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Tokai Regional Fisheries Research Laboratory, no. 23, February 1960, pp. 51-63, printed. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.

"Studies on Protein Concentrates for Animal Feeding," by J. Bunyan and S. A. Price, article, Journal of the Science of Food and Agriculture, vol. 11, January 1960, pp. 25-37, printed. Journal of the Science of Food and Agriculture, Society of Chemical Industry, 14 Belgrave Square, London, S.W. 1, England.

RESEARCH:

Research in Fisheries--1959, edited by Ted S. Y. Koo, Contribution no. 77, 45 pp., illus., printed. Fisheries Research Institute, College of Fisheries, University of Washington, Seattle 5, Wash., March 1960. Research projects of the Fisheries Research Institute and the teaching faculty of the College of Fisheries are described. The author states that "While the Institute's research is primarily concerned with Pacific salmon in Alaska, the research effort of the College faculty is directed into a multitude of facets--from bacteria to oysters, from fish behavior to radiation biology. Some problems are entirely within the realm of basic research; others have immediate applied value."

RHODE ISLAND:

The Marine Fishes of Rhode Island, by Bernard L. Gordon, 135 pp., illus. with 80 photographs, printed, \$4. Book and Tackle Shop, 7 Bay St., Watch Hill, R. I., 1960. To my knowledge this is the first comprehensive list of the 215 salt-water fish species in Rhode Island coastal waters--salt marshes, estuaries salt-water ponds, rocky shoals, and open sea. The black-and-white photographs by the author are excellent and add to the book's attraction and interest. It is the result of a five-year survey of Rhode Island coastal waters. Fishermen, fishery businessmen, vessel owners, researchers, biologists, and many others will be interested and find much valuable information in the book. According to the author, "Rhode Island has more than 400 miles of shoreline, and its waters contain many species of fish." Since colonial times, fish and shellfish have played an important part in the Rhode Island economy. After discussing the history of Rhode Island ichthyology, the author describes the survey made from 1954 to 1959 while he was a student at the University of Rhode Island and biology instructor at Rhode Island College. Also covered by the author are abundance, distribution, seasonal importance, and economic importance of the Rhode Island fish. Three major classes of fish are covered--Agnatha (jawless fishes), Chondrichthyes (cartilaginous fishes), and Osteichthyes (bony fishes). Described are some of the unusual types like barn door skate, cow-nosed ray, mermaids purse, John Dory, snipefish, pipefish, orange filefish, burrfish, etc. but also the more commonly-known

such as sharks, herring, shad, smelts, haddock, cod, pollock, hake, flounder, mackerel, etc. One chapter dwells on trends in fish populations. The book has an extensive and up-to-date bibliography as well as an index and map showing the area covered by the author's survey.

--J. Pileggi

ROUGH FISH:

Rough Fish Control, by Nicholas J. Miller, Clifford L. Brynildson, and C. W. Threinen, Publication No. 229, 13 pp., illus., printed. Wisconsin Conservation Department, Madison 1, Wis., 1959. An informative handbook covering the history of and need for rough fish control in Wisconsin, the species included in the definition, their habits, methods of control, disposition of rough fish after capture, effects of their removal on the fishery, and the future of the rough-fish control program.

SALMON:

Salmon of the Pacific Northwest (Fish vs. Dams), by Anthony Netboy, 135 pp. illus., \$3.00. Binfords & Mort, Publishers, 124 N.W. 9th Ave., Portland 9, Ore., 1958. A great North American fishery resource--the salmon--is the subject of this book. A readable and fairly comprehensive discussion of the Pacific Northwest salmon, the fishery, and the problems. This is a book for the commercial fisherman, the businessman interested in the fishing industry, the researcher, the conservationist, the economist, and even the sportsman. Not a big book, but packed with a great deal of useful information. It presents the struggle of the salmon of the Pacific Northwest to live side by side with the inroads of civilization. After successfully living in its natural habitat for thousands of years, there is the danger that civilization will completely destroy the salmon. The author in his preface points out: "In short, one cannot live in the Pacific Northwest very long before becoming aware that salmon, prince of Pacific game fishes, is an exceedingly valuable animal not only to the consumers who enjoy its succulent meat but sport and commercial fishermen and thousands of people who make their living in canneries, gear manufacture, etc." But I feel sure that members of the fishing industry will not agree with the author that, "Now, we can say that the fish are blocking the dams." The author does say: "In writing this book I have endeavored to place the complex issues in focus and in terms the layman can understand, to set down the facts without bias, and to appraise the fish vs. dams problem without prejudice."

Senator Richard L. Neuberger, in his foreword to the book, sums up the question of fish versus dams quite succinctly when he states: "I think the Pacific Northwest needs low-cost power--compellingly so. But I feel this energy should first be obtained at those sites where little or no damage will be done to our fisheries resources."

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The book describes the life history and migrations of the salmon, the Indian fishery, and the commercial fisheries. Then it goes on to discuss the encroachment of civilization, the Federal dams, the Lower Columbia River fishery program, and controversial dams (McNary, Ice Harbor, Cowlitz, Pelton, Middle Snake, Nez Perce). The next to the last chapter asks: "Can the salmon be saved?" In the last chapter the author discusses "Fish--and Power Too." This book provides a quick look at the problem of fish versus dams. It also contains a selected bibliography and an index.

--J. Pileggi

The Atlantic Salmon, by Lee Wulff, 217 pp., illus., printed. A. S. Barnes and Company, Inc., 232 Madison Ave., New York 16, N. Y., 1958. A fascinating book about the "paradoxical fish," written by a man obviously bewitched by his subject. With single-hearted devotion, he describes this fish without appetite which can still be lured by a fly; past and present salmon fishing methods; the behavior of salmon during the spawning season; types of tackle, types of wet and dry flies; where to fish for salmon; casting; where to go for salmon; and miscellaneous notes on salmon fishing. The many excellent photos, both black-and-white and in color, add to the interest of this book for both commercial and sports fishermen.

"British Columbia Salmon Reports," article, Trade News, vol. 12, no. 10, April 1960, pp. 3-4, illus., printed. Department of Fisheries of Canada, Ottawa, Canada. Discusses two recent reports released by the Canadian Department of Fisheries in the Pacific Area. These deal with the 1959 salmon catch and spawning escapement and the significance of the sharply increasing catch of salmon by sport fishermen. For the past seven years the Department has compiled estimates of the catch of salmon by sport fishermen in tidal waters of British Columbia. During this period the anglers' catches have grown steadily larger. Spawning escapements were good for chum, coho, and spring salmon during 1959.

"Two Haemoglobins in Chum Salmon," by K. Hashimoto and F. Matsuura, article, Nature, vol. 184, October 31, 1959, p. 1418, printed. Nature, St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

SARDINES:

"Aspects Biologiques et Biométriques de la Sardine (*Sardina pilchardus* Walb.) des Environs de Lisbonne, Pendant Les Années, 1952-1957" (Biological and Biometric Aspects of the Sardine (*Sardina pilchardus* Walb.) in the Lisbon Area, 1952-1957), by Jaime Dos Santos Pinto and Ivone Ferreira Barreira, article, Notas e Estudos do Instituto de Bio-

logia Maritima; no. 19, September 1958, 97 pp., illus., printed in French. Instituto de Biologia Maritima, Cais do Sodré, Lisboa, Portugal.

"Biochemical Studies on the Fat of the Sardine Body. I--Seasonal Variation in the Fat, Unsaponifiable Matter, and Cholesterol Contents of Several Tissues of the Sardine Body," by Masahito Wada, article, Nippon Nogei-Kagaku Kaishi, vol. 29, 1955, pp. 339-342, printed. Agricultural Chemical Society, Faculty of Agriculture, University of Tokyo, Bunkyo-ku, Tokyo, Japan.

"Experimental Study on Frozen Sardines," by M. Boury, article, Revue Generale de Froid, vol. 35, September 1958, pp. 845-849, printed in French. Revue Generale de Froid, Association Francaise du Froid, 29 Boulevard Saint Germain, Paris France.

"Regards sur Notre Production Sardinier" (Regarding Our Sardine Production), by L. Plouas; "A Quiberon, Premier Port Sardinier Français se Pose le Probleme de l'Equipement" (At Quiberon, the Leading French Sardine Port, There is an Equipment Problem; and "Perspectives Actuelles de la Peche a la Sardine en Espagne" (Actual Expectations for the Sardine Fishery in Spain, by V. Paz-Andrade, article, La Peche Maritime, vol. 39, no. 987, June 1960, pp. 338-343, illus., printed in French. La Peche Maritime, 190 Blvd. Haussmann, Paris 8, France.

SCHOOL LUNCH PROGRAM:

The Market for Food in Public Schools, by Kenneth E. Anderson and William S. Hoofnagle, Marketing Research Report No. 377, 62 pp., printed, 40 cents. U. S. Department of Agriculture, Agricultural Marketing Service, Marketing Research Division, Washington D. C., January 1960. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This study was undertaken as part of a broad program of research to expand markets for farm products. Results of the study indicated that the school market is primarily a local one; and that the role of Government is relatively small in supplying most commodities to the school outlet. About \$505 million or 85 percent of the total value of food used in schools was acquired through commercial channels in nearby markets. Findings showed that during the period July 1957 through June 1958, the total wholesale value of food, both purchased and donated, delivered to approximately 60,000 public schools having a food service, amounted to \$597 million or \$28 per capita based on an average daily attendance of slightly over 21 million pupils. Meat, poultry, and fish which moved into the school outlet during this period, had a value of almost \$108 million or \$5 per capita. Of this amount, \$12.8 million was the value

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of fish and shellfish consumed, accounting for 2.1 percent of the total value of food. There were 28 million pounds of fish delivered to the school lunch outlet during the period under study. The quantity of fresh and frozen fish utilized in public schools was only slightly larger than that of canned fish items. Tuna was by far the most important canned fish item, accounting for almost 8 million pounds, followed by salmon which represented slightly over 4 million pounds. Extensive and detailed statistical tables showing results of the survey are included.

SEAWEED:

Annual Report for 1959, 20 pp., printed, Institute of Seaweed Research, Inveresk, Midlothian, Scotland. Discusses development in the Scottish and foreign seaweed byproducts industry during 1959, the development of pharmaceutical products from seaweed, work of the Institute, its technical assistance services, sponsorship of seaweed research by other organizations, and a list of publications on seaweed.

"Seaweed for Food--South Wales Laverbread Industry," article, Food Manufacture, vol. 34, November 1, 1959, pp. 443-444, printed. Food Manufacture, Leonard Hill, Ltd., Stratford House, 9, Eden St., London N.W. 1, England.

SHARKS:

"The Nurse Shark and the Nurse Shark Fishery," by Levy Carlson, article, Fiskeridirekt. Skrifter Ser. Fisk., vol. 4, no. 1, 1958, pp. 1-35, printed in Norwegian. Fiskeridirekt. Skrifter Ser. Fisk., Director of Fisheries, Bergen, Norway.

"La Pesca del Tiburon en Cuba" (The Shark Fishery in Cuba), by Armando Perez Gattini, article, Mar y Pesca, vol. 3, nos. 7 and 8, April-May 1960, pp. 31, 36, illus., printed in Spanish. Mar y Pesca, Edificio L.N.R.A., Noveno Piso, Plaza Civica, Havana, Cuba.

SMELT:

"Smelt Fishing in Wisconsin, by Donald Euers, article, Wisconsin Conservation Bulletin, vol. 25, no. 4, April 1960, pp. 24-27, illus., printed. Wisconsin Conservation Dept., Box 450, Madison 1, Wis. Describes the abundant harvests of smelt in Lakes Michigan and Superior, particularly during the spring. Smelt may be landed legally by dip nets or seines and residents of Wisconsin are permitted to market them commercially.

SMOKING:

"A New Smoke Producer Makes Its Bow," article, Seafood Merchandising, vol. 19, no. 1, January 1959, p. 27, printed. Seafood Merchandising, 624 Gravier St., New Orleans 12, La.

SOUTH AFRICA:

The South African Pilchard (SARDINOPS OCELANATA) and Maasbanker (TRACHURUS TRACHURUS)--The Chaetognatha off the West Coast of the Union of South Africa, July 1954-June 1955, by A. E. F. Heydorn, Investigational Report No. 36, 55 pp., illus., printed. (Reprinted from "Commerce & Industry," February 1959.) Division of Fisheries, Beach Road, Sea Point, Cape Town, Union of South Africa, 1959.

SPAIN:

Maquinaria para Conservas de Pescado Aparecida Ultimamente en Espana (Fish Canning Machinery Recently Introduced in Spain), by F. Lopez Capont, 9 pp., illus., printed in Spanish. (Reprinted from Informacion Conservera, vol. 7, no. 66, June 1959, pp. 4-12.) Informacion Conservera, Colon, no. 62, Valencia, Spain.

"La Produccion Conservera Espanola en 1958" (Spanish Canning Production in 1958), article Boletin de Informacion del Sindicato Nacional de la Pesca, no. 17, February 1960, pp. 11-13, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6^a Planta, Madrid, Spain.

SPOILAGE:

"Bacteria Concerned in the Spoilage of Haddock: Preliminary Paper," by A. H. Gee, article, Contributions to Canadian Biology and Fisheries (new series) vol. 3, no. 14, 1927, pp. 347-364, printed. Fisheries Research Board of Canada, Ottawa, Canada.

"Studies of Fish Spoilage. II--The Origin of Trimethylamine Produced During the Spoilage of Cod Muscle Press Juice," by S. A. Beatty, article, Journal of the Fisheries Research Board of Canada, vol. 4, no. 2, May-July 1938, pp. 63-68, printed. Fisheries Research Board of Canada, Ottawa, Canada.

"Studies of Fish Spoilage, VIII--Volatile Acid of Cod Muscle Press Juice," by V. K. Collins, article, Journal of the Fisheries Research Board of Canada, vol. 5, no. 3, July 1941, pp. 197-202, printed. Fisheries Research Board of Canada, Ottawa, Canada.

STANDARDS:

Microscopic-Analytical Methods in Food and Drug Control, Food and Drug Technical Bulletin No. 1, 255 pp., illus., printed, \$2. U. S. Food and Drug Administration, Washington 25, D. C., May 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Discusses the latest methods for microscopic identification of contaminants in foods and drugs and is designed to help analysts trace adulterants to their sources. Covers product control and sanitation; sources and types of contamination; isolation and detection of contamination; microscopes, photomicrography, and exhibits; fungi associated with food decomposition; and entomology in food and drug analysis. Also covers parasites and related forms; rodent and other animal filth in foods

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and drugs; applied histology of food and drug materials; crystallography and chemical microcopy; and identification of drug tablets and capsules. This bulletin will be particularly helpful to the control departments of food processing plants. It replaces and enlarges the earlier Microanalysis of Food and Drug Products, first published in 1944 as Food and Drug Circular No. 1. It was prepared by the Administration's Division of Microbiology to show the scope of microscopic-analytical work, the approach used, and the application of such techniques to industry and regulatory problems.

STATISTICS:

Report on the Expert Meeting on Fishery Statistics in the North Atlantic Area (Edinburgh, Scotland, September 22-30, 1959), 68 pp., processed. Food and Agriculture Organization of the United Nations Viale delle Terme di Caracalla, Rome, Italy, February 4, 1960. Includes proceedings, papers presented, and discussions held under three of the agenda items covered during the meeting of experts in fishery statistics. The items included fishery statistics requirements, difficulties in meeting high priority requirements and their solution, and further improvement in fishery statistics. Topics discussed at the meeting included definitions and classifications of statistical items; simplification of statistical reporting to international organizations; conversion factors and allied topics; statistics on fish discarded at sea; statistical treatment of direct foreign landings; subsistence and sports fisheries; statistics of fishing effort; statistics on disposition, processing, distribution, and consumption; and price and value statistics. Recommendations included the establishment of a continuous Working Party on Fishery Statistics in the North Atlantic Area. Annexes contain the texts of papers presented and other pertinent information.

STORAGE:

"Keeping Quality of Pacific Coast Dogfish," by R. H. Moyer and others, article, Journal of the Fisheries Research Board of Canada, vol. 16, December 1959, pp. 791-794, printed. Fisheries Research Board of Canada, Ottawa, Canada.

SURINAM:

"Hoe Vissen We Met Een Bank-Net" (How do We Fish with a Bank-Net?) by F. F. van Dijk, article, Landbouwnieuws, vol. 12, no. 3, March 1960, p. 36, illus., printed in Dutch. Department L.V.V., Paramaribo, Surinam.

TERRITORIAL WATERS:

"La Deuxieme Conference sur le Droit de la Mer" (The Second Conference on the Law of the Sea), by Robert Lenier, article, France Pêche, vol. 5, no. 39, April 1960, p. 13, printed in French. France Pêche, Tour Sud-Est, Rue de Guemene, Lorient, France.

"La Question des Eaux Territoriales et Ses Consequences" (The Question of Territorial Waters and Its Consequences), by Jules Molard, article, France Pêche, vol. 5, no. 38, March 1960, pp. 13-14, printed in French. France Pêche, Tour Sud-Est, Rue de Guemene, Lorient, France.

TEXAS:

Population Studies of the Shallow Water Fishes of an Outer Beach in South Texas, by Gordon Gunter, 8 pp., illus., printed. (Reprinted from Institute of Marine Science, vol. 5, December 1958.) Gulf Coast Research Laboratory, Ocean Springs, Miss.

TIDES:

Tide Tables--East Coast, North and South America (including Greenland), 1961, 279 pp., printed, \$1. U. S. Department of Commerce, Coast and Geodetic Survey, Washington 25, D. C., January 1960. This handbook contains tables on daily tide predictions for 46 reference stations and differences for about 1,600 stations in North and South America, approximate height of tide at any time, local mean time of sunrise and sunset, reduction of local mean time to standard time, moonrise and moonset for eight places, and astronomical data. Explanatory notes to facilitate usage of each table are included. Also contains a list of Coast and Geodetic Survey publications relating to tides and tidal currents.

Tide Tables--West Coast, North and South America (including the Hawaiian Islands), 1961, 223 pp., printed, \$1. U. S. Department of Commerce, Coast and Geodetic Survey, Washington 25, D. C., November 1959. This handbook contains tables on daily tide predictions for 38 reference ports, tidal differences and other constants for about 1,000 stations, approximate height of tide at any time, local mean time of sunrise and sunset, reduction of local mean time to standard time, moonrise and moonset, and astronomical data. Explanatory notes to facilitate usage of each table are included. Also, contains a list of Coast and Geodetic Survey publications relating to tides and tidal currents.

TRANSPORTATION:

A Survey of Fish Transportation Methods and Equipment, by Kenneth S. Norris and others, Contribution no. 5, 31 pp., illus., printed. (Reprinted from California Fish and Game, vol. 46, no. 1, January 1960, pp. 6-33.) California Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif. Because of the need for large-scale propagation and planting of fish in streams and rivers, the transport of live fish is becoming an increasingly important problem. This article reviews available information on present live-fish transportation practices. Ninety-six state, Federal Government, and private agencies, and individuals have been polled for

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transport data. This review has been limited primarily to principles and methods. Construction methods are not reviewed in detail, except where they have a direct bearing upon the welfare of the fish being transported. Discussions are included on tank construction and materials, use of drugs in the transportation of fish, osmotic problems, loads and distances, pretreatment of fish, and history of live-fish transportation.

TRANSPORTING FISH:

"From Milk Cans to Plastic Bags," by Ludwig Frankenger, article, Wisconsin Conservation Bulletin, vol. 25, no. 4, April 1960, pp. 17-19, illus., printed. Wisconsin Conservation Dept., Box 450, Madison 1, Wis. Discusses new methods of transporting fish from hatcheries to lakes and streams. The handy plastic bags and cardboard boxes are economical for moving fry and fingerlings; when larger fish are transported, tank trucks are most satisfactory.

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--Listings under Yugoslavia supplied by K. Sepic, Engineer.





HOW FAST CAN A FISH SWIM?

At what speeds can cod and herring swim? Experiments on problems of animal locomotion carried out at the Cambridge School of Zoology have produced some interesting information on the speed at which fish swim, and their powers of endurance. Similarly, since 1955 the Marine Laboratory of the Scottish Home Department, Aberdeen, has been conducting experiments from the point of view of interest of the fishing industry.

The Cambridge experiments dealing mainly with small fish, show that a small fish can move in a short burst at a speed equivalent to traveling 10 times its own length in a second although this varies with different species. It appears that with fish up to one foot in length, the top speed of the fish is proportionate to its length. Beyond this length, the top speed increases by a less amount than in direct proportion to length. It is even suggested that the top speed of any fish can be calculated by means of a formula, given only its length and the frequency of its tail movements.

Of far greater interest are the measurements of endurance which have for the first time been made--in other words the number of times its own length that a fish can swim before becoming exhausted when stimulated continuously during its swim. The work at Aberdeen is being done mainly on marine fish, as it was felt that this information would be valuable when designing fishing gear and calculating the best speed for towing trawls.

Due to the difficulty of obtaining live healthy fish of all sizes of a particular species, only a very limited range of sizes has been measured. The most complete information is available for herring.

It appears that sea trout, brown trout, and mackerel are the fastest swimmers, with herring, haddock, and whiting next, while cod and saithe are the slowest. No speeds higher than 7-8 m.p.h. have been recorded so far. Although careful check was kept of the temperature, there is no evidence of this affecting the maximum speed to any extent. It is likely, however, to affect the cruising speed.

In order to relate the maximum swimming speed to chance of fish escaping from nets, it is necessary to know how long they can sustain a near maximum speed.

The number of body lengths swum before becoming exhausted can be called the endurance of the fish. Thus the endurance of herring is highest; next come small and large sea trout. All white fish have a much lower endurance, one-quarter or less than that of herring. An interesting fact is that small individuals of a particular species have greater endurance than large individuals.

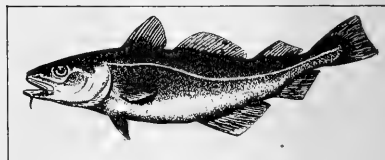
MACKEREL--One of the fastest.



HERRING--In the second group of swimmers.



COD--Slow swimmer, low endurance.



Speed and Endurance of Certain Fish

Fish	Average Length in Inches	Average Distance Swum in Inches	No. Body Lengths Swum Before Becoming Exhausted
Herring . . .	9	10,000	1,100
Sea trout . .	9	8,700	965
Mackerel . .	14	6,600	470
Saithe . . .	7	4,000	290
Haddock . . .	7	1,900	270
Whiting . . .	9	3,300	370
Cod . . .	16	2,300	140
	7	1,600	230
	5	800	160
	21	2,700	130

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Fishes

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COMMERCIAL FISHERIES REVIEW



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

Joseph Pileggi, Editor
H. M. Bearse, Assistant Editor

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62 ..	Italy Buys Frozen Tuna only in Small Lots		Venezuela:	
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DEVELOPMENT AND USE OF OTTER-TRAWLING GEAR FOR RED SNAPPER FISHING IN THE GULF OF MEXICO, JUNE 1957-MAY 1959

By Francis J. Captiva* and Joaquim B. Rivers*

SUMMARY

The snapper fishery of the Gulf of Mexico, traditionally a hand-line fishery, recently has been faced with severe economic problems and has been seeking a solution through the development of more effective fishing gear and methods.



Fig. 1 - The M/V Silver Bay--96.4-foot North Atlantic dragger used in the snapper-trawl studies.

The U. S. Bureau of Commercial Fisheries chartered vessel Silver Bay, a 96.4-foot North Atlantic trawler, was used, therefore, to carry out a study designed primarily to develop otter-trawling gear and methods and to introduce these to the snapper fishery. The study was conducted intermittently from June 1957 through May 1959.

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Bottom-trawling gear, consisting of nylon netting, wooden rollers, and Vigneron-Dahl (V-D) rigging, was developed that successfully permitted trawling on rough and broken bottom and that could be used with vessels now existing in the Gulf of Mexico.

Commercial quantities of marketable snapper and grouper were taken with the gear developed. Two simulated-commercial cruises to the Campeche Banks area yielded catches totaling 44,504 pounds of marketable snapper and grouper from depths of 20 to 50 fathoms. Daily catches ran as high as 2,400 pounds and the maximum single drag yielded 1,775 pounds. On several occasions, trawl catches exceeded the catches of hand-line vessels working the same area.

Use of electronic devices (loran, radar, and especially depth-recorders) proved to be of great practical value.

Results suggest that the otter trawl can be a profitable commercial gear for snapper and grouper in the Gulf of Mexico fishery.

BACKGROUND

The commercial fishery for red snapper and grouper of the Gulf of Mexico has been carried out almost exclusively with hand lines for the past century. The hand-line method has proved unprofitable in many cases despite the willingness of the industry to adopt new accessory equipment, including mechanical reels (Siebenaler and Brady 1952), depth recorders, and electronic navigational aids (Rathjen 1958). Recently, a substantial decrease in production per unit of effort on the part of the hand-line vessels (Camber 1955), coupled with high production costs and a shortage of competent personnel, placed the industry in a position so unfavorable economically that some operators ceased snapper fishing activities entirely.

One approach to the solution of the industry's problem lies in the development and introduction of more efficient fishing gear and methods. The industry, alone and in cooperation with research agencies, had experimented in the past with gill nets (Stearns 1885), fish traps (Jarvis 1935; Bullis 1951; Springer 1951), hoop nets (Smith 1948a&b), long lines (Stearns 1885; Jarvis 1935; Whiteleather and Brown, 1945), and bottom trawls in attempts to increase the effectiveness of the fishing operation; but at the time of the experiments all of those methods and gear were found deficient in some respect and none was adopted.

Notwithstanding deficiencies noted in early trawling experiments conducted by the industry, additional experiments conducted by the U. S. Bureau of Commercial Fisheries research vessel Oregon, and occasional reports of large catches of snapper by shrimp trawlers, continued to suggest the possibility of bottom trawls as practical commercial gear for red snapper in the Gulf of Mexico, if trawl gear capable of performing on rough and broken bottom could be found.

The M/V Silver Bay, which was acquired by the Bureau through charter in May 1957 to supplement exploratory work already in progress in the Gulf of Mexico and off the Atlantic coast of the Southeastern States, was used largely, therefore, to conduct snapper-trawling experiments. The objective of the experiments was the design and development of bottom-trawling gear suitable for use in the commercial snapper fishery by fishing vessels available in the Gulf of Mexico.

VESSEL AND EQUIPMENT

The M/V Silver Bay, a conventional North Atlantic dragger of welded-steel construction, was built in 1946. The vessel has an over-all length of 96.4 feet, a beam of 22.6 feet, and a draft of 12 feet. Insulated hold space is available for approximately 200,000 pounds of iced fish. Accommodations are provided for 17 men. The main propulsion plant develops 562 brake-horsepower at 350 r.p.m., providing a cruising speed of nine knots, and fuel and water capacity are sufficient for 20 days of continuous operation. A heavy-duty double-drum trawling winch is driven by the main engine through a front power take-off and chain-and-sprocket drive. Capacity of each winch drum is approximately 650 fathoms of $\frac{1}{8}$ -inch-diameter cable.

Vessel design and deck arrangement permit trawling from either the port or the starboard side. This arrangement, and the identical gear carried on each side, kept lost fishing time to a minimum for, when gear damage occurred on one side, the gear on the other side was ready to be used immediately.

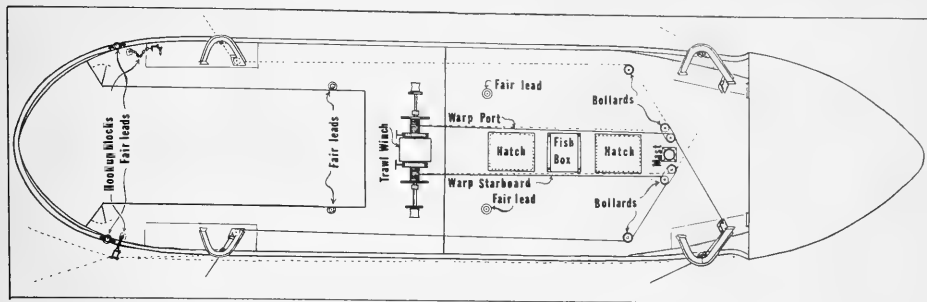


Fig 2 - Deck plan of M/V Silver Bay--the bollard-fairlead arrangement allows trawling from either the port or the starboard side of the vessel.

Electronic equipment aboard the Silver Bay included: Two loran receivers, radar, deep-water depth-recorder (0- to 2,200-fathom range), "white-line" depth-recorder (0-to 480-fathom range), shallow-water depth-recorder (0- to 450-fathom range), and a magnetic-compass automatic pilot.

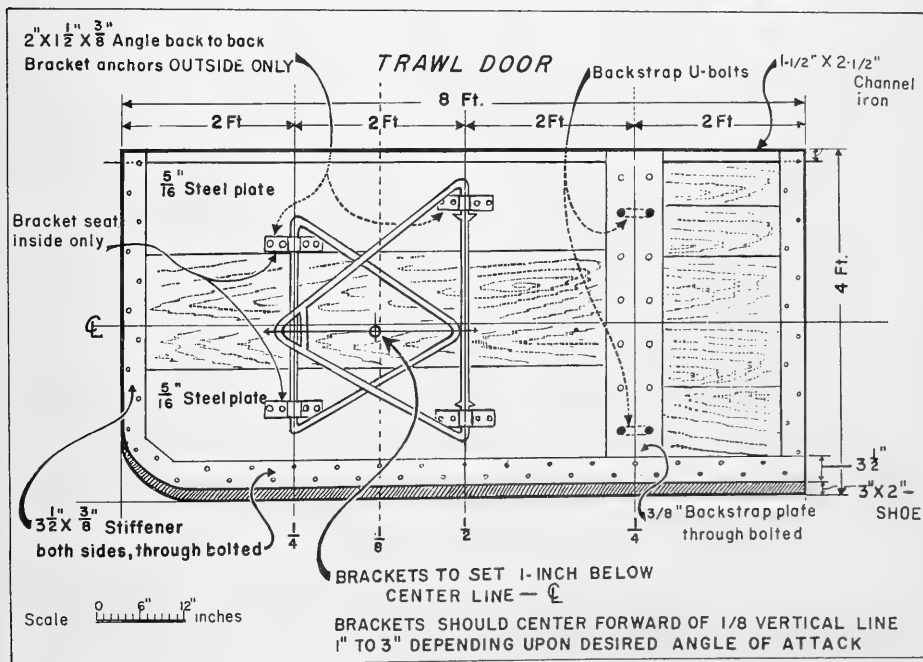


Fig. 3 - Bracket doors, 4 by 8 feet and reinforced with steel plate, were used to spread the snapper trawling gear.

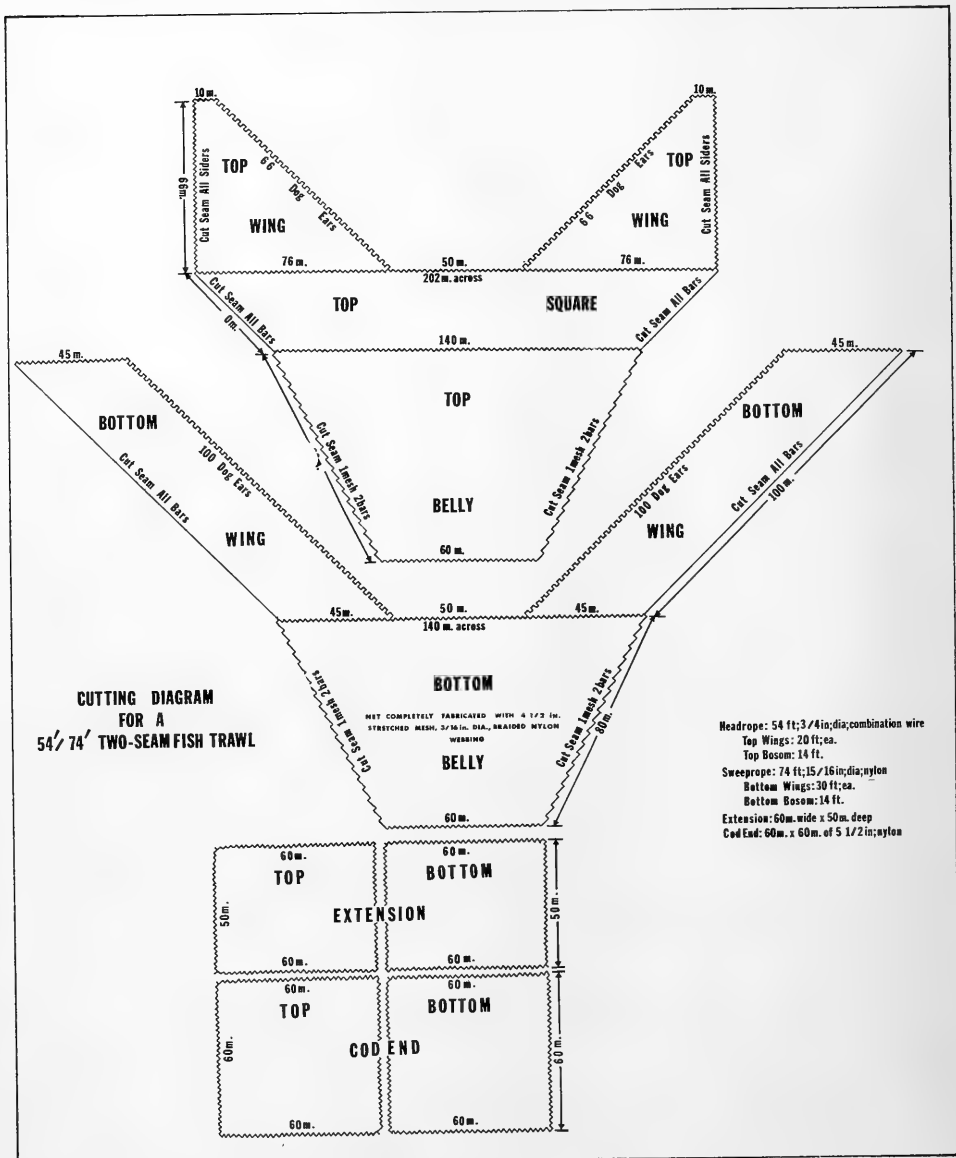


Fig. 4 - Construction diagram of the 54-foot-74-foot snapper trawl.

GEAR AND METHODS

Conventional North Atlantic gear, constructed from manila and cotton twine, was used at the beginning of the trawl studies. This gear was fished with bracket doors and Vigneron-Dahl (V-D) rigging and has been described in detail by Knaek (1956). Results obtained were not satisfactory, but served to point out where modifications were needed.

Modified gear was then developed, tested, and found suitable for fishing rough- and broken-bottom areas. Its reasonable cost, simplicity of design, and relatively small size make the modified gear suitable for many fishing vessels in the Gulf of Mexico.

OTTER BOARDS: Rectangular boards measuring 4 by 8 feet and weighing approximately 900 pounds each were used to spread the trawl (figs. 3 and 6). The doors were constructed from 2½- by 8-inch lumber and were heavily reinforced with steel angle and flat bar. The brackets, constructed from 1¼-inch round bar were attached to the doors in the conventional manner (fig. 4). The doors proved rugged enough to resist the sudden shocks received in hang-ups and required only minor repairs during the two-year period of use.

TRAWL: The high-opening, 2-seam fish trawl, hung 54 feet on the headrope and 74 feet on the footrope (fig. 4), was constructed from 5½-inch-mesh braided nylon twine. Braided-nylon twine with a tensile strength of approximately 400 pounds was preferred to other types of nylon twine because its superior knot strength enabled the meshes to hold their shape even when the twine was subjected to great stress. The increased strength of the braided twine--2 to 4 times that of cotton twine of equivalent weight--enabled the gear to be fished on rough bottom with minimum gear loss or damage.

Wooden rollers, 20 to 24 inches in diameter, were strung on ½-inch-diameter steel roller wire. Roller separation was accomplished with 6-inch wooden spacers used in pairs on the bottom bosom section (separating the rollers by 12 inches) and in groups of three on the wings (providing a spacing of 18 inches). The rollers were used along the full length of the footrope and were attached to the trawl by 20-inch roller chains stopped onto the footrope--one chain at each large roller. Details of attachment are shown in figure 5.

The trawl was "hung in" 20 percent on the top and bottom wings (i.e., 20 percent more stretched netting was used than hanging line) and 37 percent on the top and bottom bosoms. This modification in hanging materially reduced a common type of damage in which the hanging selvage is torn from the hanging line.

Forty 7-inch standard spherical floats were first used to raise the headline. These gave satisfactory results at dragging speeds up to 3 knots, but were apparently completely ineffective at 4 to 5 knots. Substitution of a patented "rising-panel device" for the floats in the bosom section provided a solution to problems encountered in high-speed trawling, and catches at higher speeds increased following the substitution.

Manila "helpers" or "belly lines," 2¼ inches in circumference, were attached to the 4 corners of the trawl and sewn full length to the cod end. The helpers were sewn down the square mesh from the corner rather than on the bar, as is the custom with standard gear (fig. 6). Additional pieces, approximately 3 to 4 fathoms in length, were attached at intervals along the bottom wings and belly.

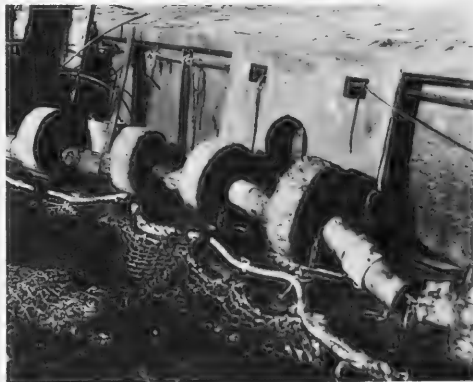


Fig. 5 - Bosom section of trawl showing method of attaching rollers to footrope.

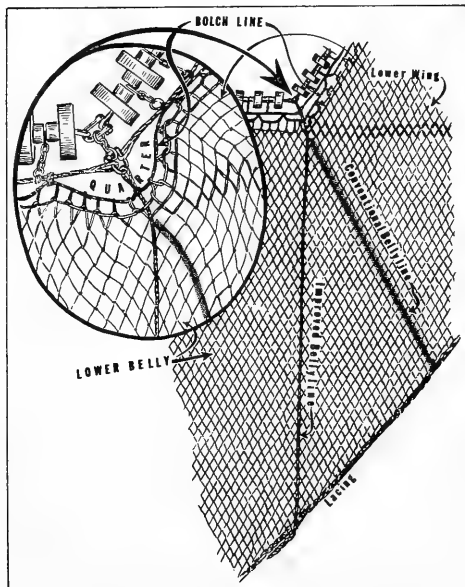


Fig. 6 - Detail of trawl quartershowing attachment of modified "helper" or "belly line."

The headrope was $\frac{3}{4}$ -inch-diameter manila-clad wire rope. Doubled $\frac{3}{16}$ -inch-diameter braided nylon twine was used to hang the webbing to the headrope and bolch line. Approximately 3 inches of slack was allowed in hanging. The bolch or hanging line (fig. 6) was approximately 20 percent longer than the nylon footrope and was stopped onto the latter in bights with single braided nylon twine. To prevent chafing by coral and rock, a heavy bull hide was attached full length to the bottom of the cod end.

FISHING METHODS: The roller gear, and associated Vigneron-Dahl rig, was handled by the side-trawl method described by Knake (1958). Although not mandatory, this method greatly facilitates handling heavy gear with minimum manpower (figs. 7 and 8).

The trawl was normally fished with two 10-fathom legs that were connected directly



Fig. 7 - "Shooting" the trawl in the side trawling operation.

to the boards through a kelly-eye and stopper arrangement. In general it was found that the greater the distance between boards and trawl, the greater the catch; but the number of hang-ups increased proportionately with the length of the ground cables on bad bottom. A total of 15 fathoms of ground cable was added between legs and doors when bottom conditions were suitable. A 3:1 ration of towing-wire length to water depth was used normally, but on extremely rough bottom the ratio was reduced to 2:1.



Fig. 8 - Bosom rollers being brought on deck with the "gilson" (whip). Wing rollers remain overboard.

FISHING RESULTS

Operations during the first year (June 1957-May 1958) were concerned primarily with gear design and modification and were confined to the known bad-bottom red snapper grounds of the north and northwestern Gulf of Mexico. Trawl catches in those areas were generally small, but were of sufficient magnitude to permit tentative evaluation of the effective-

ness of the gear. Results during this period have been reviewed by Rathjen (1958).

Trawling operations were extended to Campeche Bank in the spring of 1958 so that the trawl gear could be tested in areas being fished by hand-line vessels. A total of 5 cruises were completed on the Bank from May 1958 to May 1959. At least limited exploratory coverage was extended to all the areas of the Bank of known productivity. Good catches were confined to the areas south and west of Cayos Arcas. Two simulated commercial production cruises (Nos. 12 and 16) completed in those areas resulted in a total catch of 44,504 pounds of marketable snapper and grouper. Catch data by depth and season are summarized in table 1, and results of cruises 12 and 16 are summarized in table 2.

Daylight trawl catches on Campeche Bank ranged as high as 2,400 pounds of snapper and grouper per day. The best individual drag resulted in 1,775 pounds of fish in 90 minutes of fishing time. Nighttime trawling consistently yielded much smaller catches.

Table 1 - Snapper and Grouper Catch by Season and Depth, M/V Silver Bay, Cruises 8, 12, 14, 15, and 16, Campeche Area							
Season and Depth	No. Trawl Drags	Trawl Catch			Average Catch Per Drag		
		Snapper	Grouper	Total	Snapper	Grouper	Total
(Pounds)							
Spring:							
0-10	0	0	0	0	0.00	0.00	0.00
11-20	1	9	0	9	9.00	0.00	9.00
21-30	122	13,329	3,209	16,538	109.25	26.30	135.55
31-40	41	9,916	600	10,716	241.85	19.51	261.36
41-50	13	1,468	168	1,656	114.46	12.92	127.38
51-60	3	7	20	27	2.33	6.66	8.99
61+	5	0	0	0	0.00	0.00	0.00
Totals	185	24,749	4,197	28,946	-	-	-
Averages	-	-	-	-	133.77	22.68	156.45
Fall:							
0-10	0	0	0	0	0.00	0.00	0.00
11-20	0	0	0	0	0.00	0.00	0.00
21-30	74	22,330	1,109	23,439	301.75	14.98	316.73
31-40	2	753	41	794	376.50	20.50	397.00
41-50	0	0	0	0	0.00	0.00	0.00
51-60	0	0	0	0	0.00	0.00	0.00
61+	0	0	0	0	0.00	0.00	0.00
Totals	76	23,083	1,150	24,233	-	-	-
Averages	-	-	-	-	303.72	15.13	318.85
Winter:							
0-10	0	0	0	0	0.00	0.00	0.00
11-20	0	0	0	0	0.00	0.00	0.00
21-30	59	9,583	1,209	10,792	164.42	20.49	184.91
31-40	18	2,568	95	2,663	142.66	5.27	147.93
41-50	5	430	0	430	86.00	0.00	86.00
51-60	1	150	0	150	150.00	0.00	150.00
61+	0	0	0	0	0.00	0.00	0.00
Totals	83	12,731	1,304	14,035	-	-	-
Averages	-	-	-	-	153.38	15.71	169.09
All-Season Totals	344	60,563	6,851	67,214	-	-	-
All-Season Averages	-	-	-	-	176.05	19.33	195.38



Fig. 9 - Large red snapper and jewfish taken in a trawl drag south of Cayos Arcas by the M/V Silver Bay.

A total of 11 species of snapper were represented in trawl catches (table 2), of which 3 species (red snapper, mutton snapper, and lane snapper) were taken in commercial quantities. Red snapper accounted for the largest part of the total catch, and that species was taken in all areas of operation--most commonly between 20 and 50 fathoms. Most of the snapper taken in water shallower than 30 fathoms weighed more than 1 pound, although smaller snapper were more abundant in deeper water. Lane snapper and mutton snapper were taken in quantities on Campeche Bank between 20 and 30 fathoms, but were absent from catches in other areas.

A total of 9 species of grouper were represented in the trawl catches. The species occurring commonly are listed in table 2. Red grouper, black grouper, and scamp accounted for the bulk of the grouper catch in all areas fished. On Campeche Bank, grouper catches made up as much as 10 percent of the total catch, but in other areas the percentage due to grouper was smaller. Grouper were present at all depths fished.

On several occasions, daily trawl catches greatly exceeded the hand-line catches of individual vessels fishing the same area. This

Species		Catch			
Scientific Name	Common Name	Cruise 12, November-December		Cruise 16, April-May	
		Total Weight	Average Weight	Total Weight	Average Weight
<i>Lutianus ayg</i>	Red snapper	1/11,449	5	14,271	8
<i>Lutianus synagris</i>	Lane or rainbow snapper	1/ 3,308	1 1/2	624	1 1/2
<i>Lutianus analis</i>	Mutton or king snapper	6,115	10	3,760	10
<i>Lutianus griseus</i>	Gray snapper	222	8	175	20
<i>Lutianus apodus</i>	Schoolmaster snapper	683	6	251	5
<i>Ocyurus chrysurus</i>	Yellowtail snapper	334	2 1/2	-	-
<i>Rhomboplites auroraberco</i>	Vermilion snapper	1/ 900	8	-	-
<i>Lachnolaimus maximus</i>	Hog snapper	72	2	74	5
<i>Epinephelus morio</i>	Red grouper	446	8	427	10
<i>Mycteroperca</i> (2 sp.)	Scamp	312	4	628	8
<i>Mycteroperca bonaci</i>	Black grouper	392	12	948	15
<i>Lutianus vivanus</i>	Yelloweye or silk snapper	-	-	11	4
<i>Gareus nigrita</i>	Warsaw grouper	-	-	20	10
<i>Epinephelus</i> (2 sp.)	Rock hind	-	-	22	3
<i>Promicropus itaira</i>	Jewfish	-	-	260	130
Totals		24,233	-	21,471	-

1/Indicates approximately 1,200 lbs. of unmarketable snapper taken when a 2-inch mesh liner was used for sampling purposes.

occurred most often when rough seas prevailed, but at other times trawl catches were larger owing, perhaps, to the fish not being attracted to the hand-line bait.



Fig. 10 - A 1,000-pound snapper catch dressed and ready for stowage aboard the M/V Silver Bay.

(B)



(C)



(A)

Fig. 11 - Escapement tests: (A) Releasing cod-end cover. The small fish which have sifted through the large mesh cod end can be seen just inside the cover. (B) Small fish which escaped through the cod-end mesh, but were retained by the 2-inch mesh cover (C) Large fish retained by the $5\frac{1}{2}$ -inch mesh of the cod end.

A number of experiments were conducted to determine the escapement rate of undersize snappers through the $5\frac{1}{2}$ -inch-mesh cod end. These experiments, which consisted of intermittent use of 2-inch cod-end covers, indicated that approximately 95 percent of all snapper under one pound in round weight successfully escaped through the $5\frac{1}{2}$ -inch mesh of the cod end (fig. 11).



Fig. 12 - Weighing the catch aboard the M/V Silver Bay prior to icing the fish.

USE OF ELECTRONIC FISHING AND NAVIGATIONAL AIDS

The electronic equipment carried by the M/V Silver Bay has been listed previously. Use of this equipment greatly facilitated snapper fishing operations.

RADAR: Radar was especially valuable when the vessel was fishing small grounds at night or during other periods of restricted visibility. When used in conjunction with small anchored radar buoys, the radar enabled the vessel to stay within the limits of known grounds, thereby increasing the catch and minimizing gear losses.

LORAN: Loran provided a means of pinpointing productive grounds and provided a means of easily relocating areas of high potential.

DEPTH RECORDERS:

Each of the three depth-recorders carried aboard the vessel served a specific function. In combination, or singly, they were used to provide constant assessment of the sea bed and fish concentrations. The shallow-water depth-recorder, although not designed for fish finding, was used to delineate bottom conditions owing to the finely detailed bottom tracings that could be obtained with this machine (fig. 13). It was in use almost continuously while trawling. The deep-water depth-recorder was used more extensively for navigational purposes and for locating the banks and grounds.

The "white-line" recorder was used extensively, while trawling and before, owing to its ability to portray concentrations of demersal fish and to separate those concentrations from the sea bottom (fig. 14). Although complete evaluation of the effectiveness of this recorder in detecting fish schools cannot be accomplished at pres-

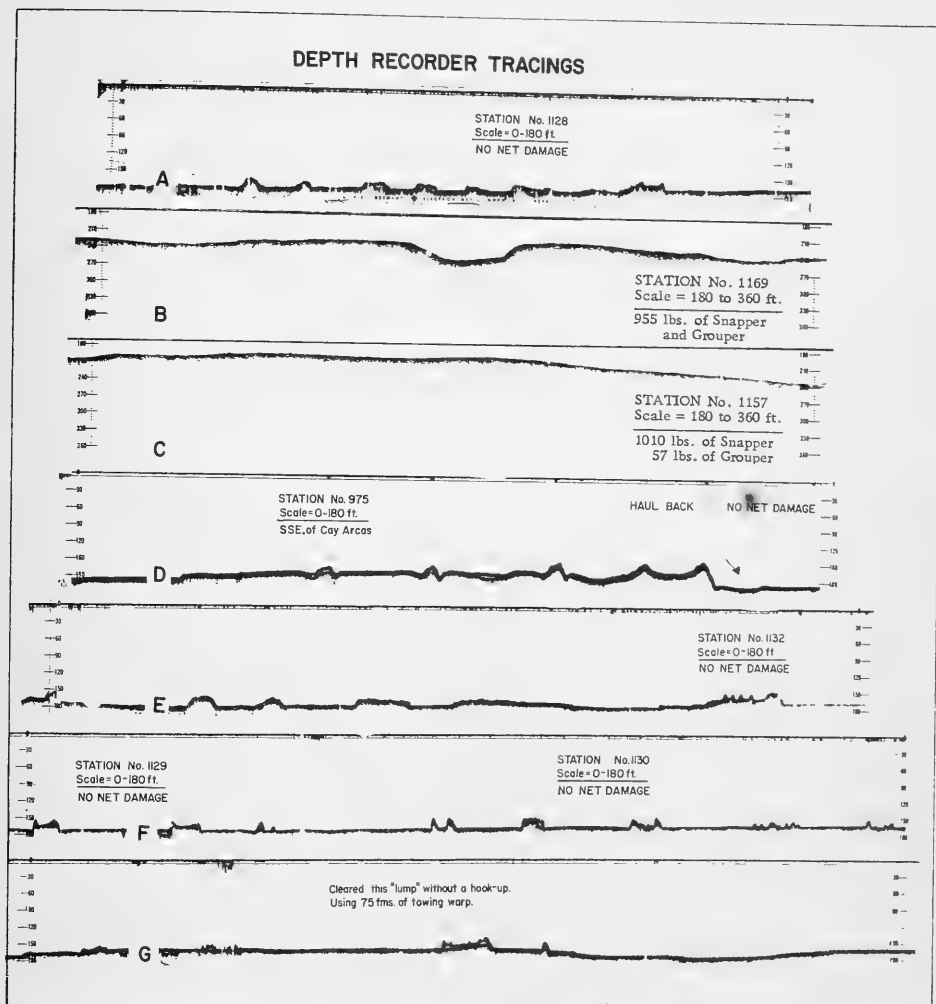
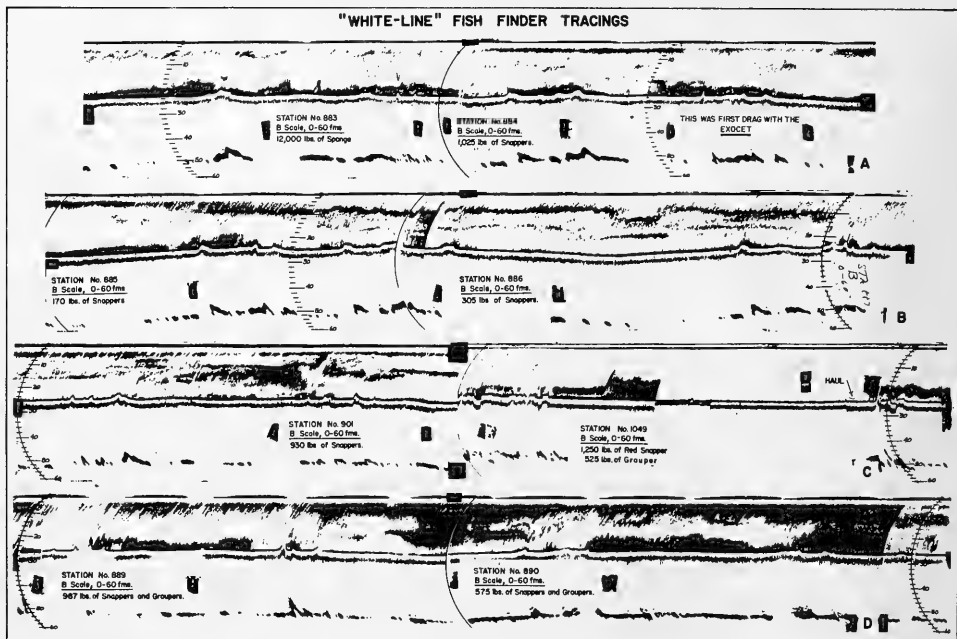


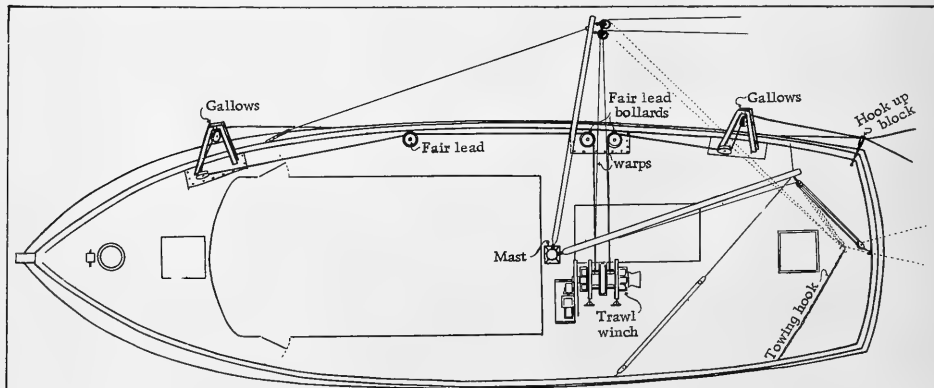
Fig. 13 - Depth-recorder tracings of sea bed on the red snapper grounds south and west of Cayo Arcos. The shallow-water recorder was not designed for, and did not pick up, fish concentrations.

ent--owing to the passage of small species of fish and squid through the $5\frac{1}{2}$ -inch meshes of the cod end--on several occasions some correlation between catch and echo-tracings was possible. More experience with the machine is necessary before interpretations of the tracings can be completed.



CONVERSION OF GULF OF MEXICO SHRIMP TRAWLERS TO SNAPPER TRAWLING

Only minor modifications and the installation of relatively inexpensive deck equipment are necessary to convert existing shrimp vessels to snapper-trawling gear and techniques (fig. 15). Owing to the relatively small cost of conversion, vessels can be rigged for snapper fishing in times of small shrimp catches as well as for year-round snapper fishing.



The modifications and approximate costs of conversion, at 1959 price levels, for a typical shrimp vessel are summarized as follows:

1. Gallows frames, bollards (deck blocks), and other permanent deck fittings; including installation Approx. cost \$1,500
2. Double-drum trawl winch^{1/}--capacity 150 to 200 fathoms of $\frac{5}{8}$ -inch-diameter cable Approx. cost 2,500
3. Heavy-duty bracket doors ($6\frac{1}{2}$ feet by 44 inches, weight 500 to 600 pounds each), per pair Approx. cost 300
4. Braided nylon trawl ($\frac{54}{74}$ foot) rollers, floats, cod end, and accessories Approx. cost 900
5. Vigneron-Dahl gear, legs, ground cable, towing chains, and accessories Approx. cost 200
6. Accessory gear--quarter ropes, lazylines, messenger, and shackles Approx. cost 150
7. Towing warp $\frac{5}{8}$ -inch-diameter^{2/}, 300 fathoms Approx. cost 500

CONCLUSIONS

1. Modified otter trawls can be used as effective commercial means of catching red snapper, grouper, and other species in the Gulf of Mexico.
2. Broken and rough bottom areas, previously considered untrawlable, can be worked economically with gear properly designed and constructed.
3. Additional species of marketable snapper, not generally caught with hand lines, are available to trawl gear.
4. Release of undersize snapper is accomplished effectively by large-mesh trawls and cod ends.
5. Daily trawl catches often surpass those of hand-line vessels when the two methods are used simultaneously in one area--especially when the fish are apparently not feeding or during periods of heavy seas.
6. Trawl gear, suitable for use by present Gulf of Mexico shrimp vessels, can be adopted by the industry either on a full scale or as a supplementary operation during periods of low shrimp catches.

APPENDIX

A detailed fishing log, showing geographic position, depth, date, catch, and related data for each drag, is available as an appendix to the reprint of this article. Write for Separate 600, which shows "Table 3 - Fishing Log--Trawl Stations--1957-59--M/V Silver Bay."

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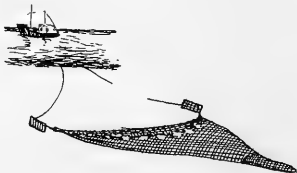
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KELP AND HERRING SPAWN

Two commercial operators at Craig, Alaska, harvested 46 tons of kelp and herring eggs this spring. The procedure is to place kelp on herring spawning grounds to collect a layer of herring eggs on the kelp. A light covering of eggs on the kelp is sought; however, this spring approximately two-thirds of the total weight of the harvested product consisted of herring eggs.

The product is packed in barrels and shipped to the oriental market on the West Coast. The oriental trade there considers it a delicacy. U. S. Bureau of Commercial Fisheries biologists claim the number of eggs removed in this operation will have no measurable effect on herring production.

STRUCTURE OF THE FISHING INDUSTRY IN THE EUROPEAN COMMON MARKET

By P. Hovart*

BACKGROUND

Since the end of World War II, an effort has been made to integrate the western European economies at an accelerated rate. Several plans have been worked out for that purpose--some remain theoretical speculation, but others have been put into practice.

By the Treaty of Rome six western European nations--Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany--agreed to establish a European Common Market on January 1, 1958. The first important agreements of the Treaty^{1/}, namely, the reduction of import duties and the extension of quota restrictions became effective on January 1, 1959.



Fig. 1 - A modern Belgium distant-water trawler operating out of Ostend.

The Common Market plans the gradual removal of international tariffs and quotas and the development of a single tariff system between the Six, or Common Market Countries, and the rest of the world^{2/}.

The Treaty also provides for the free movement of persons, services, and capital; for common policies with respect to agriculture (and fishing industry), transport, and competition; and for coordination of national policies on many aspects of economic development.

A number of common institutions have been set up in order to implement the principles and the general provisions of the Treaty.

The establishment of the European Common Market is tied to a timetable. This means that at certain stages measures will be taken, so that after a transition period of 12 to 15 years the Common Market will become a complete reality.

The consequences of the Common Market for western European trade and industry are not fully foreseeable as yet. This also applies to the fishing industry of Western Europe.

The evolution of fisheries in the Common Market, however, can be visualized by examining its structural elements, such as catching capacity, production, consumption and foreign trade^{3/}.

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^{1/}Articles 14 and 33.

^{2/}Article 3.

^{3/}For this study the author has drawn certain data from "Introductory Report about the Fishing Industry in the European Common Market." The author wrote the report for the Professional Fisheries Council in Belgium. The statistical data, however, were revised and regrouped.

The fishing capacity in the Common Market Countries^{4/} can be determined to a limited extent by examining their statistics on fishing fleets and the number of fishermen.

FISHING FLEET

Generally speaking, the Common Market Countries exploit the same fishing grounds. The North Sea is the main source of supply, but more distant fishing grounds are also exploited.

But the fishing fleets of the Common Market Countries vary widely, and not all craft or all categories of vessels are of the same importance.



Fig. 2 - The fish auction, IJmuiden, Netherlands.

The Belgian fishing fleet consists of motor vessels (440 with 67,243 hp. and 25,446 gross registered tons) and steam vessels (6 with 6,420 hp. and 3,783 GRT). According to the engine power, which limits also the field of operation, the fleet is divided into seven categories^{5/}: from cutters (15 hp. and 5 GRT each) to deep-sea trawlers (1,450 hp. and 768 GRT each). On January 1, 1958, the Belgian fleet numbered 446 units--29,229 gross registered tons and 73,663 hp.^{6/}

During the past few years, the Belgian fishing fleet has increased in number, tonnage, and horsepower. It is striking, however, that the number of vessels of the smaller types has

^{4/}As Luxemburg has no fishing industry, it has been left out of the study, except for its foreign trade which is included with Belgium since a Belgium-Luxemburg Customs Union has existed for many years.

^{5/}Namely, cutters (less than 80 hp.), coastal motor trawlers (80-119 hp.), medium trawlers (120-239 hp.), deep-sea motor trawlers (240-349 hp.), deep-sea medium motor trawlers (350-499 hp.), deep-sea large motor trawlers (over 500 hp.), and large deep-sea steam trawlers (over 439 hp.)

^{6/}Source: Bestuur van het Zeewezen.

decreased. The increase in the number of units, tonnage, and horsepower is the result of adding larger and more powerful vessels to the fleet. Since World War II no new small vessels have been built, and this explains the unfavorable average age (24 years) of the smaller vessels.

In France, the fishing fleet consists of steam, motor, and sailing vessels. At the beginning of 1958 the French fleet consisted of 15,912 units with 250,011 gross registered tons¹--28 steam trawlers with 11,471 GRT, 13,500 motor trawlers with 234,831 GRT, and 2,384 sailing vessels with 3,709 GRT.

Since the last war the number of steam trawlers and sailing boats has greatly decreased in France. The motor trawlers, on the other hand, have increased in tonnage as well as in horsepower. Recently the building of larger vessels has been strongly stimulated in France.



Fig. 3 - Unloading and boxing of fish at Boulogne, France.

In Italy there were 43,948 vessels as of January 1, 1958, with a tonnage of 147,913 gross registered tons--11,126 motor vessels and small motor boats (total 102,032 GRT) and 32,822 sailing boats (total 45,881 GRT)⁸. The number of sailing vessels are decreasing, but motor vessels have been partly modernized during the last few years.

The Netherlands fishing fleet includes a great variety of vessels, the classification of which varies from row boats to sailing vessels to motor trawlers of 800 hp. On January 1, 1958, the fishing fleet consisted of 669 vessels registered for sea fisheries with a total tonnage of 66,867 gross registered tons⁹. Included are steam trawlers, steam luggers, motor

¹Includes Algeria--the number of vessels in Algeria totaled 1,123 units of which 1,068 were motor vessels and 65 sailing vessels.

Source: Ministère de la Marine Marchande.

⁸Source: "Il Giornale della Pesca" (September 5, 1958).

⁹Source: Directie van de Visserijen.

trawlers, motor luggers, and motor cutters. A number of the vessels--mostly the smaller ones--are also registered for inshore fisheries and fisheries in Lake Ijssel. Also, there are motor boats, sailing boats, and row boats which almost exclusively operate in the inshore fisheries.



Fig. 4 - German distant-water trawler tied up at dock, Hamburg. Note overhead ice conveyor for icing-up vessels.

Since 1950, the number of steam vessels has decreased. On the other hand, motor trawlers and motor luggers increased. The motor cutters also grew in numbers and fishing capacity.

In West Germany the fishing fleet consists of trawlers, luggers, cutters, and open boats without motors. At the beginning of 1958, the German fishing fleet numbered 3,429 units, of



Fig. 5 - Lugger-type trawler, engaged principally in fishing for North Sea herring docked at Hamburg.

which 29 were motor trawlers with a total of 18,209 gross registered tons, 177 steam trawlers (total 94,303 GRT), 104 luggers (total 24,063 GRT), 1,443 cutters, and 1,676 open boats without motors¹⁰.

After World War II the German trawler fleet had to be almost completely rebuilt. At first it was prohibited to build vessels of more than 400 gross registered tons. Later this restriction was removed and larger and more profitable vessels could be built (to about 800 GRT). At the same time the development was characterized by a conversion of coal-burning vessels into oil-burning vessels. Since 1950, steam luggers have disappeared. The motor luggers increased in number, but the new vessels generally had to replace the obsolete ones. In the cutter fleet, the vessels became larger and the engine power was increased.

CATCHING CAPACITY

Generally speaking, the catching capacity of the fishing fleet in the Common Market Countries is now greater than before the war and continues to increase. Larger and faster vessels are built, not only for distant-water fisheries, but also for near- and middle-water fisheries. At the same time, the vessels are equipped with modern navigational aids.



Fig. 6 - Fish auction at Cuxhaven, Germany

GOVERNMENT AID TO FISHING INDUSTRY

This development of the fishing fleets is largely a result of government policy to encourage the expansion of fishery production.

In Belgium a loan of up to 70 percent of the value of the vessel (or the motor) can, in principle, be obtained for the building or purchase of a fishing vessel (or a motor)¹¹. The Government allows a reduction in interest up to half of the normal rate of interest with a maximum of 3 percent, but demands a first mortgage on the vessel or motor. The loan is

¹⁰/Source: *Jahresbericht über die Deutsche Fischerei*, 1957, pp. 105-111.

¹¹/Law of August 23, 1948.

generally repayable in 12 or 10 years, respectively, for vessels and motors built or bought in Belgium or abroad.

Further, four Royal Warrants^{12/} grant certain financial concessions to vessel owners: (1) financial aid for improving fishing equipment, (2) a subsidy to encourage research on fishing methods, (3) a premium to encourage the collection of data concerning costs and earnings, and (4) a premium to vessel owners and boys for each day spent at sea.

In France, three plans have affected the fishing industry: the first is a program for reconstruction, and the second and third are plans for modernization and development which include aid from the Government.

First, the shipyards are granted subsidies for the construction of vessels of more than 50 gross registered tons^{13/}; and second, a reduction in interest is granted to vessel owners obtaining a loan for the construction in France of a vessel of more than 20 gross registered tons, which reduces the rate of interest to 4.5 percent^{14/}. Finally, the Government made available additional funds to the "Credit Maritime Mutuel," so as to permit that organization to grant cheap loans to small fishing enterprises. The second and third plans for modernization and development include aid for processing and distribution as well as production.



Fig. 7 - Dock and wharf buildings at Hamburg-Altona fish harbor, Hamburg, Germany.

In Italy loans for the development of fisheries may be granted from a special fund ("Fondo di rotazione")^{15/}. The loans are partly or completely guaranteed by the Government. In Italy there is also special assistance for the development of the fishing industry in the South^{16/}.

In the Netherlands Government aid to the fishing fleet is integrated in the Law on Material War Damage and the Special Finance Program for the Fishing Industry. The Law on Material War Damage^{17/} grants financial aid for repair or rebuilding of fishing craft. As postwar costs have risen considerably, provision is made in the law for special interventions, namely: (1) loans guaranteed by the Government and (2) "supplementary" financial aid. A

further provision applicable to the fishing industry is "facility credit," that is, credit with certain concessions as to interest rates and repayment^{18/}.

The Netherlands' Special Finance Program for the Fishing Industry^{19/} provides for financial aid on the basis of a fleet plan. Under this program the building of vessels can be financed by paying 25 percent in cash; obtaining another 25 percent on a mortgage; and supplying the balance of 50 percent as a loan from the Bank for Reconstruction. The latter loan is partially guaranteed by the Government.

In West Germany the Government grants loans for the building of fishing craft, allows a reduction in interest to 2 percent, grants subsidies for fuel, and subsidies for exploring new fishing grounds. From 1949 to 1951 the Government granted a coal subsidy and from 1951 to 1954 some reduction of taxes for firms and individuals who had interest-free loans for shipbuilding. Special aid is given deep-sea cutter and coastal fisheries.

^{12/}Royal Warrants of March 1, 1958.

^{13/}Law of May 24, 1951, and decree of November 25, 1951.

^{14/}Decree of March 18, 1954.

^{15/}Law of December 27, 1957.

^{16/}Law of July 29, 1957.

^{17/}This law dates from February 9, 1950, and took effect on February 24, 1950.

^{18/}This arrangement only applies to cases (rebuilding or repair) where credit is requested; it dates from August 9, 1954.

^{19/}The Program was in force on November 30, 1955, and is based on the report of the Commission for the Development of the Fishing Industry (Commission Tinbergen), which was submitted to the Government in May 1952.

NUMBER OF FISHERMEN

Because statistical data are lacking, the exact number of fishermen in the Common Market countries cannot be ascertained. Estimates indicate the following: Belgium about 1,800; France about 54,500; Italy about 123,000; Netherlands about 10,000; and West Germany about 117,000^{20/}.

In connection with the number of fishermen, it is interesting to mention the productivity per fisherman and per gross tonnage of vessel (table 1). No real significance, however, can be accorded these figures; they only indicate the general trend^{21/}.

West Germany ranks first for productivity per fisherman as well as for productivity per one gross tonnage of vessel. With regard to fisherman productivity, Belgium is second. For productivity per one gross tonnage of vessel, the Netherlands is second.

Table 1 - Productivity Per Fisherman and Per One-Gross Tonnage of Vessel in Common Market Countries in 1958

Country	Amount of Fish (Landed Weight) Produced Per	
	Fisherman	One Gross Tonnage of Vessel
	. . . . . (Metric Tons)	
Belgium	32.0	2.0
France	8.5	1.9
Italy	1.6	1.3
Netherlands	26.4	3.0
West Germany	54.0	3.7

LANDINGS

In 1958, the total landings of fish and shellfish (including crustaceans and molluscs) of the Common Market Countries amounted to 1.6 million metric tons, landed weight. West Germany was the main producing country with about 631,300 tons, or 39.1 percent of the total landings; followed by France (28.8 percent), the Netherlands (16.3 percent), Italy (12.2 percent), and Belgium (3.6 percent).

Table 2 - Landings in Most Important Fishing Countries of the World Compared with the Combined Landings for the Common Market Countries (Annual Average for 1953-57)^{1/}

Countries	Landings 1,000 Metric Tons
Japan	4,826
United States	2,716
China (Communist Mainland)	2,460
Russia	2,380
Norway	1,878
Common Market Countries	1,709
United Kingdom	1,070

^{1/}Yearbook of Fishery Statistics, 1958, vol. IX, Food and Agriculture Organization.

Table 2 compares the combined fishery landings of the Common Market Countries with those of the most important fishing countries of the world.

On the basis of the average landings for 1953-57, the combined landings of the Com-

mon Market Countries are sixth in importance as compared with the other leading fishing countries of the world.

CATCH TRENDS: During the five years of 1954-1958, the total fishery landings of the Common Market Countries decreased from 1,641,800 metric tons in 1954 to 1,614,800 tons in 1958, a decrease of 1.6 percent (table 3). The landings in that period reached the highest point in 1955 (1,733,100 tons).

The trend in fishery landings for each individual country is not the same as that for the six countries combined.

In Belgium the landings were highest in 1955, namely about 73,000 tons. After 1955 the landings dropped, but in 1958, they were slightly higher than in 1957. The French landings increased 7.6 percent from 1954 to 1956; after 1956 they remained at the same level. In Italy

Table 3 - Fishery Landings in the Common Market Countries, 1954-58^{1/}

Countries	1958	1957	1956	1955	1954
	. . . . . (1,000 Metric Tons--Landed Weight)				
Belgium	57.6	56.4	62.2	72.9	66.2
France ^{2/}	465.8	465.1	478.1	458.6	444.4
Italy	196.5	204.7	208.0	208.0	207.6
Netherlands	263.6	252.8	249.8	264.1	286.9
West Germany	631.3	663.8	669.7	729.4	637.2
Total	1,614.8	1,642.8	1,668.5	1,733.1	1,641.8

^{1/}Excluding fresh-water fish and salmon, trouts, smelts, etc.

^{2/}Including Algeria.

Source: Yearbook of Fishery Statistics, 1958, vol. IX, Food and Agriculture Organization.

^{20/}Source: Data from the Ministry of Agriculture, Brussels.

^{21/} refer to the calculations of Dr. G. Meseck in "Jahresbericht uber die Deutsche Fischerei" 1957, p. 7.

there were no important changes in landings from 1954 to 1956; in 1957 and especially in 1958, however, landings dropped off considerably. In the Netherlands the landings reached their lowest level in 1956; for 1957 and 1958 landings were higher, namely about 252,800 tons and 263,600 tons, respectively. In West Germany the peak year was 1955 (729,400 tons). After that year the German landings dropped off heavily--in 1958 the landings totaled about 631,000 tons, a decrease of 13.5 percent as compared to 1955.

COMPOSITION OF CATCH: In the Common Market, particularly roundfish and fresh herring are landed. Between 1954 and 1958, 43.7 percent and 19.5 percent of the total landings consisted of roundfish and fresh herring, respectively. The fact that roundfish and herring predominate in catches is in a way the crux of the productivity problem of the Common Market Countries. For, generally speaking, these species are, to say the least, not very popular with the consumer. Herring, moreover, is extremely seasonal in occurrence and much of the roundfish is caught far away from the main consumer centers^{22/}.

The composition of the catches in the member countries by species groups is shown in table 4.

Country	Roundfish		Herring		Sprat ^{3/}	Mackerel	Sardines	Shrimp ^{4/}	Mussels	Other	Total	
	Flatfish	Large ^{1/}	Small ^{2/}	Salted								Fresh
Belgium	12.0	26.8	4.1	-	10.2	1.3	0.4	-	2.3	-	6.0	63.1
France	13.2	128.5	114.4	0.3	48.9	2.0	34.9	33.5	3.1	5.8	77.8	462.4
Italy	0.5	6.4	80.3	-	-	-	-	68.0	0.6	2.9	46.3	205.0
Netherlands . .	19.8	24.3	5.9	77.7	44.3	2.0	13.6	-	5.0	57.3	13.6	263.5
W. Germany . . .	8.7	173.8	161.7	45.7	219.3	4.8	7.8	-	5.5	7.3	31.2	666.3
Total	54.2	359.8	366.4	123.7	323.2	10.1	56.7	101.5	16.5	73.3	174.9	1,660.3

(1,000 Metric Tons)

1/Cod, hake, haddock, etc.
 2/Miscellaneous marine teleosteans.
 3/Including anchovy.
 4/Food shrimp.
 Source: FAO Yearbook of Fishery Statistics, 1958, vol. IX.

Of the Common Market Countries, the two most important producing countries of roundfish are West Germany and France. For the years 1954-58, Germany supplied 48.3 percent of the large roundfish and 44.1 percent of the small roundfish landed in Common Market Countries. France supplied 35.7 percent of the large roundfish and 31.2 percent of the the small roundfish. Fresh herring is mainly landed by West Germany; between 1954 and 1958 the West German landings accounted for 68.0 percent of the total landings of herring in Common Market Countries, followed by France and the Netherlands.



Fig. 8 - Conveyors used for unloading herring from fishing vessels at Hamburg-Altona fish harbor.

For the supply of salted herring, the Netherlands are of paramount importance (account for 62.8 percent of the total landings). Sardines are supplied by Italy and France only. For flatfish the Netherlands accounts for 36.5 percent of the total landings, while the landings by France and Belgium are at about the same level (12,000 to

^{22/}Source: "OECE-Fish Marketing in Western Europe Since 1950," Paris, p. 23.

EX-VESSEL PRICES

French ex-vessel or landed prices for fishery products from the sea are very high in comparison with those in the other Common Market Countries. For salted herring and mackerel, the Netherlands reports the lowest prices. For flatfish, large roundfish, fresh herring, and shrimp, German prices are the lowest.

At the coastal fish markets, ex-vessel prices are determined at auction sales. But as the prices at the point of landing depend on many factors, wide fluctuations are characteristic.

In order to obtain a certain stability of prices, Belgium, France^{23/}, the Netherlands, and West Germany have established a system of minimum ex-vessel or landed prices for certain sea products. The system only aims at giving a "bottom" to the market and works rather simply. The products which do not obtain the minimum price by auction sales are not sold for human consumption, but are disposed of at a much lower price to fish-meal factories. The difference between the minimum price and the price obtained from fish-meal factories is paid from a special fund (equalization fund). The fund is financed by a special levy on the value of the fish sold at auctions. In Belgium the minimum prices are fixed by a shipowners' union in deliberation with the Ministry of Agriculture. In the Netherlands they are fixed by the Marketing Board for Fishery Products; there are however also minimum prices (e.g. for sprat and for salted herring) which are fixed by the owners' associations. In West Germany the Government fixes the prices on the basis of the Fisheries Law of August 31, 1955.

INTERNAL TRADE, UTILIZATION, AND CONSUMPTION

The landings of fishery production in the Common Market Countries are supplemented by imports, while a part are destined for export. The organization and the supply of the domestic markets in each country varies widely from one country to another. Generally speaking, the fishery products reach the consumer through a chain of wholesalers, importers, or exporters; and retailers or hawkers.

In West Germany much attention is given to the vertical structure of the fishing industry; this is estimated of essential importance for the profitability of the industry. A vertical structure means that shipowners have financial interests in catching activities, in the whole-sale trade, in the processing industries, and even in the retail trade. In other Common Market Countries (the Netherlands and France, e.g.) efforts for a similar organization are continued.

The processing industries are more developed in one country than in another of the Common Market Countries, but generally the same industries are found in all the countries. In the Common Market the processing industries can still be further developed. This is clear from the enormous amount of fish which is sold fresh. Table 5 shows the utilization of the landings.

In the Common Market about 60 percent of the landings are marketed fresh and not even 2 percent are frozen. In Italy and Belgium fish is mostly sold fresh--86.7 percent and 75.2 percent of the landings, respectively. The Netherlands leads all the other countries in the utilization of fishery landings for dried, smoked, or salted fish, and also for fish meal and oil. France leads in the amount used for canning.

^{23/}In France there is an arrangement on landed prices in a limited number of ports.

Table 5 - Percentage of Utilization of the Fishery Landings in Common Market Countries, 1958^{1/}

Country	For Fresh Market	For Freezing	For Curing	For Canning	For Reduction	For Other Purposes
Belgium ^{2/} . . .	75.2	7.8	12.5	2.9	1.6	-
France ^{3/} . . .	5/60.4	-	27.9	11.7	-	-
Italy	86.7	1.9	7.2	4.2	-	-
Netherlands	48.5	3.5	30.6	6.4	5.3	5.7
W. Germany ^{4/}	-	-	-	-	-	-
Total	63.0	1.9	23.7	8.2	1.6	1.6

1/Source: FAO Yearbook of Fishery Statistics, 1958, vol. IX.
 2/1955.
 3/Includes Algeria.
 4/Not available.
 5/Marketed fresh and for freezing.

Table 6 - Per Capita Consumption of Fishery Products in Common Market Countries, 1955-56^{1/}

Country	Pounds
Belgium and Luxemburg	33.7
France	32.3
Italy	27.3
The Netherlands	23.6
W. Germany	35.0

^{1/}Source: Fish Marketing in Western Europe Since 1950, p. 54. Organization of European Economic Cooperation, Paris.

which can contribute to an increase are: good quality, ready-to-cook products, regular supply of reasonably-priced fish, and well-planned advertising.

FOREIGN TRADE

The Common Market's trade balance for fishery products shows a considerable import surplus--for the years 1956-58, the Common Market had an annual average import surplus of 189,200 tons. Table 7 shows the average imports and exports of fishery products per country for the years 1956-58.

The two main fish-importing countries in the Common Market are West Germany and Italy--during the years 1956-58, those countries imported on the average 122,900 tons and 123,500 tons, respectively. France also imports large quantities of sea products (91,000 tons). In West Germany the annual average exports were about 41,700 tons. Italy, on the contrary, only exported 1,600 tons, so that she has the largest import surplus of the Common Market (-121,900 tons).

The Netherlands is the most important exporter of marine products in the Common Market--for the years 1956-58, 151,100 tons on the average. Her imports only amounted to 21,100 tons. The Netherlands is the only country in the Common Market to report an export surplus on the trade balance for marine products.

During the last five years, from 1954 to 1958, the fishery products imports in the Common Market increased from 376,976 tons to 455,049 tons; an increase of 20.7 percent. The peak year for imports was 1958.

Table 8 - Common Market Fishery Imports and Exports by Commodity Groups and by Country, Annual Averages 1956-58^{1/}

Commodity Groups	Belgium	France	Italy	Netherlands	West Germany	Total
. (1,000 Metric Tons)						
Imports:						
Fresh fish ^{2/}	12.3	31.3	34.3	7.5	20.5	105.9
Fresh herring	6.5	3/	3/	3.0	69.3	78.8
Salted, dried or smoked herring	12.8	4.4	3.7	0.8	11.4	33.1
Other processed fish	3.2	0.6	57.9	0.4	1.7	63.8
Canned fish	17.5	23.4	24.1	3.7	19.4	88.1
Molluscs and crustaceans	25.1	31.4	3.5	5.7	0.6	66.3
Total	77.4	91.1	123.5	21.1	122.9	436.0
Exports:						
Fresh fish ^{2/}	7.5	2.0	0.4	16.2	20.3	46.4
Fresh herring	1.5	3/	3/	21.5	0.6	23.6
Salted, dried or smoked herring	0.7	0.4	-	49.0	2.3	52.4
Other processed fish	2.9	28.4	-	1.0	6.4	38.7
Canned fish	0.7	3.2	0.9	13.0	7.5	25.3
Molluscs and crustaceans	1.2	3.9	0.3	50.4	4.6	60.4
Total	14.5	37.9	1.6	151.1	41.7	246.8

^{1/}Source: National statistics.

^{2/}1. e. fresh and frozen fish, excluding fresh herring.

^{3/}Included with fresh fish.

The consumption of fish is at a low level in the Common Market Countries (table 6).

Italy has the lowest per capita consumption while West Germany has the highest. In Belgium the consumption is practically as high as in West Germany.

In the future the consumption of fish can increase in the Common Market. The chief factors

Table 7 - The Common Market's Fishery Imports and Exports by Country, Annual Averages 1956-58^{1/}

Country	Imports	Exports	Net Import (-) Net Export (+)
. (1,000 Metric Tons)			
Belgium	77.4	14.5	- 62.9
France	91.1	37.9	- 53.2
Italy	123.5	1.6	-121.9
Netherlands	21.1	151.1	+130.0
W. Germany	122.9	41.7	- 81.2
Total	436.0	246.8	189.2

^{1/}Excludes fresh-water fish, caviar, and fish meal.
Source: National statistics.

In 1958, the Common Market fishery exports were equal to those of 1954 (about 257,600 tons); in 1955, 1956, and 1957 they were at a lower level.

COMPOSITION OF IMPORTS AND EXPORTS:

The composition of imports and exports in the Common Market as a whole is not the same; imports and exports vary also widely from one country to another.

About 24.3 percent of the imports of the Common Market consist of fresh fish (excluding herring), followed by canned fish, fresh herring, molluscs and crustaceans, processed fish and salted, dried or smoked herring.

About 24.5 percent of the exports of the Common Market consist of molluscs and crustaceans, followed by salted, dried or smoked herring, fresh fish, processed fish, canned fish, and fresh herring.

SOURCE OF IMPORTS--DESTINATION OF EXPORTS: The source of imports and the destination of exports of the Common Market as a whole and for each country separately vary considerably.

Table 9 - Common Market Fishery Imports by Country of Origin and Exports by Country of Destination, Annual Averages 1956-58^{1/}

Country	Imports		Exports	
	From Common Market Countries	From Other Countries	From Common Market Countries	From Other Countries
	..... (1,000 Metric Tons)			
Belgium ..	55.8	21.6	9.3	5.2
France ..	39.5	51.6	12.4	25.4
Italy ..	21.6	101.9	0.3	1.3
Netherlands	8.0	13.1	107.3	43.8
W. Germany	27.8	95.1	20.5	21.2
Total	152.7	283.3	149.8	96.9

^{1/}Source: National statistics.

As shown in table 9, 35 percent of the imports come from member countries and 65 percent from other countries. Belgium imports 72.1 percent of her imports from member countries. The Netherlands is the main supplier, followed by West Germany and France. The most important sea products imported from the Netherlands are molluscs and crustaceans, salted herring, and fresh fish. France imports 43.4 percent from member countries. Again the largest quantities, especially molluscs and crustaceans, are supplied by the Netherlands. In Italy and the Netherlands, respectively, 17.5 percent and 37.9 percent of the imports come from the Common Market countries. For Italy, France (processed fish) and West Germany are the important suppliers. For the Netherlands, West Germany (fresh fish) and Belgium are the principal suppliers. West Germany imports 22.6 percent of her imports from member countries, especially from the Netherlands (fresh and salted herring) and Belgium. Nonmember countries mainly supply Italy (82.5 percent of her total imports), the Netherlands (62.1 percent of her imports), and West Germany (77.4 percent of her imports).

About 60 percent of the exports of the Common Market Countries are destined for member countries and about 40 percent to other countries. Belgium sells 64.1 percent of her exports to the Common Market. France is the most important market for Belgium (especially for fresh fish). France exports 32.7 percent to member countries, with Italy her best customer. Italy is not important as an exporter. The Netherlands, on the contrary, sells more than 71.0 percent of her exports to member countries. Her principal markets are Belgium, France, West Germany, and Italy. West Germany has an outlet in the Common Market for about 49.2 percent of her exports, and her best customers are Italy and France. As an outlet for sea products, nonmember countries are important to Italy, France, and West Germany.



Fig. 9 - Trawl doors and other vessel supplies on dock at Hamburg.

TRADE BARRIERS

The import duties and quota restrictions still protect the national fishing industries in the Common Market. Import duties on fishery products are still rather high in the Common Market, except for Belgium and the Netherlands^{24/}. Moreover, they include many products.

^{24/}In Belgium and the Netherlands there are only duties on canned goods and on certain species of molluscs and crustaceans.

In France the import duties vary between 9 (certain species of molluscs and crustaceans) and 31.5 percent (fillets); in Italy between 0 and 27 percent (canned fish); in West Germany between 0 and 27 percent (certain species of molluscs and crustaceans). The imports are also subject to other duties, e.g. fiscal taxes (Belgium and the Netherlands); sales taxes (West Germany); taxes for sanitary control and inspections (in France); statistical levy (in Italy).

The Common Market countries have agreed to establish a common external tariff. For most of the fishery products there was an agreement on the external tariff by the signing of the Treaty; for other products--fresh fish and salted, dried or smoked fish--the level of the tariff would be fixed by negotiations^{25/}.

Recently an agreement was reached on the level of the external tariff for those products. For the Benelux-countries the external tariff includes a stronger protection, while for other countries, France in particular, the protection will be weaker.

On January 1, 1959, the quota restrictions were extended, but the imports are at the moment more liberalized in one member country than in another. The intra-Benelux fish trade is liberalized, but the Benelux-countries still have quota restrictions for fresh fish (excluding sprat), fresh herring, salted, dried or smoked herring, and shrimp. West Germany has import quotas for salted herring and herring fillets, dried fish, and shrimp; France has restrictions for fresh fish, canned fish, and certain species of dried fish.

CONCLUSION

In order to establish a Common Market for the fishing industry, certain adjustments inevitably will be necessary. The development of the fishing industry in the Common Market can, however, hardly be foreseen for the moment; many factors will have an influence, while uncertainty still prevails about the interpretation of many provisions of the Treaty of Rome. This is especially so for the provisions about the common policy for the fishing industry. The Treaty provides for three possibilities of a common policy: (1) common rules concerning competition; (2) coordination of the national market organizations; (3) a European market organization. Whichever possibility will be chosen, the aims of common policy will be tied to it. The aims are: (1) increase of productivity; (2) reasonable standard of living for those engaged in the fishing industry; (3) stabilization of the market; (4) a regular supply; and (5) reasonable prices to the consumers.

The extension of the Common Market for the fishing industry will further depend on the coordination of all regulations in the industry. Up till now the governmental and private regulations differ from each other. Moreover, numerous practices are not fully understood nor easily determined.

Uniform regulations together with an over-all European policy, however, will make possible complete understanding between the member countries, and at the same time allow fisheries to develop.

^{25/}Article 20.



FIRST OYSTERS IMPORTED FROM JAPAN FOR CULTIVATION

Professor Mitsukari of the Imperial University of Tokyo suggested in 1899 that oysters from Akkeshi Hokkaido, a northern island, would be best adapted for transportation to America. In 1902, four carloads of Japanese oysters were planted in Puget Sound on the west coast of the United States. The following year 12 carloads were planted, and the practice has continued, with success, on a much larger scale.

--"Sea Secrets," The Marine Laboratory,
University of Miami, Coral Gables, Fla.



TRENDS AND DEVELOPMENTS

American Samoa

TUNA LANDINGS, JULY 1960:

Tuna landings by Japanese long-line fishing vessels for the United States-owned tuna canneries in American Samoa amounted to 1.8 million pounds in July 1960 as compared with about 2.7 million pounds in July 1959. The January-July 1960 total of 15.4 million pounds was up 3.5 percent from the same period of 1959.

Species	July		Jan.-July	
	1960	1959	1960	1959
Albacore	1,597	2,208	12,655	11,286
Yellowfin	172	388	1,601	2,902
Big-eyed	57	68	1,112	672
Skipjack	-	-	-	1/
Total	1,826	2,664	15,378	14,860

(1,000 Lbs.)

1/ Less than 500 pounds.

Note: All of the tuna landed in July 1960 was by Japanese long-line vessels.



California

PHYSIOLOGICAL STUDY OF PACIFIC SALMON:

M/V "Nautilus" Cruise 60N6: The area off San Francisco (Muir Beach to Pedro Point) was surveyed from July 12-14, 1960, by the California Department of Fish and Game's research vessel *Nautilus* to obtain and keep alive, for physiological experiments, immature, ocean-caught chinook salmon. The fish were to be brought aboard without sustaining an obviously damaging injury and with minimum exertion on their part, to be held under conditions which would facilitate their return to a state of physical rest. Another objective was to examine chinook salmon in the 20-22 inch size range to determine their sex and stage of maturity.

In the course of three days' fishing, more than 100 chinook salmon were caught; 31 were successfully held in a large live-bait tank for varying lengths of time, up to 56 hours, and 22 others were examined for stage

of maturity and sex. Most of the latter had sustained serious injuries while being caught or landed. All other fish were released without being brought aboard or handled. This was accomplished by use of the so-called button-hook fish releaser.

Of the 22 fish examined, 17 were males (77 percent), and every fish was immature (would not spawn in 1960).

One marked salmon was captured. It had been one of about 250,000 fingerlings trucked to, and released in, lower San Francisco Bay early in 1959. When captured, it was 23 inches long, weighed 4.5 pounds and was in its second year of life.

During the last day, a team of scientists conducted physiological studies of fish which had been held for this purpose in the live-bait tank. The objective of the studies is to obtain knowledge about the cause of aging and death of an organism with particular reference to Pacific salmon.



Cans--Shipments for Fishery Products,

January-June 1960

Total shipments of metal cans during January-June 1960 amounted to 60,560 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 53,815 tons in the same period a year ago. The increase of about 12.5 percent in the total shipments of metal cans January-June this year as compared with the same period of 1959 was probable due to orders in anticipation of a sharp increase in the Alaska canned salmon pack.

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.



Central Pacific Fisheries Investigations

STUDIES INITIATED ON GENETIC DEFINITION OF TUNA STOCKS:

An intensive study of Pacific tuna species with reference to the hereditary composition of tuna stocks was started recently by the U. S. Bureau of Commercial Fisheries.

Geneticists in the recently-implemented program at the Bureau's Honolulu Biological Laboratory report a major advance in the study of skipjack tuna populations with the development of a battery of serological test fluids which will detect complex patterns of individual differences between the red blood cells of different skipjack. These antigenic differences analogous to those found in man (A-B-O, etc.) and other vertebrates are the products of the units of inheritance (genes).

Laboratory scientists report that a study of the frequency with which the various characters occur in tuna populations will lead to a genetic definition of tuna stocks. Such a definition may allow a more sophisticated study to be made of growth, recruitment, and mortality rates which may be unique for different racial or genetic stocks within the same species.

The antigenic characters themselves which are in a sense analogous to "natural" tags on the population level may also yield important information regarding the geographic distribution and migration of the tunas.

Preliminary studies have been carried out by the Honolulu Laboratory and visiting university scientists on a small scale since 1955 and more recently with the La Jolla, Calif., Biological Laboratory of the Bureau.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-JUNE 1960:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the De-

Quantity				Value			
June		Jan.-June		June		Jan.-June	
1960	1959	1960	1959	1960	1959	1960	1959
. (1,000 Lbs.) (\$1,000)			
2,718	2,212	11,740	11,346	1,195	1,170	5,986	5,987

partment of Defense, 2.8 million pounds (value \$1.2 million) of fresh and frozen fishery products were purchased in June 1960 by the Military Subsistence Supply Agency. This exceeded the quantity purchased in May by 27.7 percent, and was 22.9 percent greater than the amount purchased in June last year. The value of the purchases this June was 8.3 percent greater than the previous month and 2.1 percent more than for June 1959.

During the first six months of 1960 purchases totaled 11.7 million pounds (valued at almost \$6.0 million)--an increase of 3.5 percent in quantity and no change in value as compared with the same period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in June 1960 averaged 44.0 cents a pound, 7.8 cents less than the 51.8 cents paid in May and 8.9 cents less than the 52.9 cents paid during June 1960.

In June, the Agency also bought 2,000 pounds (valued at \$15,000) of dehydrated fish for experimental purposes.

Canned Fishery Products: Tuna was the principal canned fishery product purchased

Product	Quantity				Value			
	June		Jan.-June		June		Jan.-June	
	1960	1959	1960	1959	1960	1959	1960	1959
Tuna	166	-	1,449	1,832	75	-	656	868
Salmon . . .	3	5	3	12	2	4	2	9
Sardines . .	22	160	84	669	9	28	35	100

for the use of the Armed Forces during June this year. In the first six months of 1960, purchases of canned tuna, salmon, and sardines were substantially lower than in the same period in 1959.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Fish Farming

DIRECTOR APPOINTED FOR NEW EXPERIMENTAL STATION:

Appointment of Dr. James H. Stevenson of Little Rock, Ark., to direct the new fish farming research program of the U. S. Bureau of Sport Fisheries and Wildlife, Department of

the Interior, was announced on August 3, 1960, by Bureau Director Daniel H. Jansen.

Stevenson will be in charge of the Bureau's research program into many of the problems of raising fish in conjunction with the growing of rice and other agriculture crops. Some of the problems to be worked out include effects of water quality and levels; control of aquatic vegetation; overpopulation; predation; intrusion of unwanted species of wild fish; disease and parasite infestations; proper stocking levels; nutritional requirements along with feeding materials and methods; spawning requirements and methods of controlling or inducing spawning; and brood stock selection.

The two tracts of land acquired by the Bureau for the fish farming experiments total 296 acres. One of the purchased tracts comprises 85 acres immediately adjacent to the University of Arkansas' Rice Branch Experiment Station near Stuttgart. The second tract, which is of a different soil type, is 211 acres adjoining the University's Southeast Branch Experiment Station at Kelso.

The Stuttgart property will have a modern laboratory; fish-holding facilities; a building for shop, garage and storage; a reservoir of about 30 acres; and experimental ponds ranging from one-tenth acre to one acre in surface area. The Kelso land has a high producing well and an adequate surface water supply. Levees have been constructed on three sides of 160 acres of the plot. Five, ten, and twenty-acre reservoirs are planned for the site.

Stevenson, who was formerly head of the Department of Zoology at Little Rock University and biologist for the Arkansas Game and Fish Commission, recently returned from a five-month assignment with the International Cooperation Administration to advise the government of Pakistan on development of its inland fisheries.

* * * * *

CONTRACT LET FOR NEW EXPERIMENTAL STATION IN ARKANSAS:

A contract was executed on June 10, 1960, for first-phase construction for the new Fish Farming Experimental Station near Stuttgart, Arkansas. Specifications call for completion of the two headquarters buildings. One will contain offices and laboratories for biology, chemistry, and disease and parasite research; the other a combination building, will house a small shop, garage, storage, and fish-holding tanks.

Second-phase construction, for which bids will be solicited in the near future, will include a 30-acre reservoir, and three series of one-tenth, one-quarter, and one-acre experimental ponds, complete with water-supply system.



Great Lakes Fisheries Exploration and Gear Research

EXPLORATORY FISHING WITH OTTER TRAWL STARTED IN LAKE MICHIGAN:

M/V "Art Swaer II" Cruise I: The U. S. Bureau of Commercial Fisheries inaugurated the Lake Michigan Exploratory Fishing and Gear Research Program with the cruise of a chartered Lake Michigan commercial gill-net tug that has recently been adapted to the newly-introduced otter-trawl method of fishing. On August 10, 1960, the chartered vessel, Art Swaer II, was scheduled to start a seven-day trawl fish exploratory cruise.

Exploratory fishing operations were carried out in eastern Lake Michigan at depths from 10 to 50 fathoms. The operational area was confined to waters between Ludington and South Haven.

The objectives of the cruise were to determine the distribution and abundance of the various species of fish that can be taken with otter trawls in that area at this time of year. Special effort was made to assess the potential yield of fish stocks that are presently only slightly exploited on a commercial basis. The characteristics of the lake bottom was analyzed and charted to show the location and extent of areas suitable for otter trawling.

Standard commercial Gulf of Mexico-type semiballoon fish trawls with 70-foot footropes were used. Electronic depth-recorders were employed to determine lake-bottom characteristics and the vertical distribution of fish.

Great Lakes Fishery Investigations

CHEMICAL CONTROL PROGRAM FOR SEA LAMPREY ON SCHEDULE:

Progress in the Great Lakes chemical-control program for sea lamprey makes it apparent that the goal of treating all known lamprey-spawning streams tributary to the United States shore of Lake Superior in

1960 will be reached. Two of the most difficult treatments were completed in July-1960--the Bad River-White River system in Wisconsin and the Ontonagon River in Michigan. Two smaller streams were also treated.

* * * * *

EXPERIMENTAL TRAWLING REVEALS SPAWNING SUCCESS OF CERTAIN SPECIES:

Experimental trawling in Green Bay, Lake Michigan, and in Lake Erie has given some indication of the success of the 1960 spawning of certain Great Lakes species. As of August, no 1960 yellow pike had been taken in Green Bay even on grounds that yielded many young-of-the-year in 1959. Young yellow perch had been caught but in very small numbers. Juvenile smelt were extremely plentiful. Yellow pike of the 1960 year-class were taken at a number of localities in western Lake Erie, but in such small numbers as to indicate spawning success far below that of 1959. Reproduction seems to have been poor also in the spottail shiner and possibly the sheepshead. Young yellow perch had been caught in good numbers but were less plentiful than in 1959. Catches of the young-of-the-year white bass and smelt were very large.

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LAKE ERIE FISH POPULATION SURVEY:

M/V "George L." May-June 1960: Extensive trawling operations were conducted by the U. S. Bureau of Commercial Fisheries research vessel George L. and commercial fish catches were examined in May and June. United States commercial catches of yellow perch, sheepshead, carp, channel catfish, and white bass have been good. Yellow pike catches were about one-half of those last spring and catches of blue pike, cisco, and whitefish have been very light.

Yearling yellow pike (hatched in 1959) continue to appear in large numbers in commercial trap nets in the western basin. Great variations in catch from week to week in the same areas indicate that the yellow pike move about continuously in loosely-formed groups. The average length of yearling yellow pike taken in trap nets in late June was about 11½ inches. Several 13-inch yearling fish have been landed by commercial fishermen. At the present rate of growth (½ inch per month), most of those fish should exceed 13 inches by September 1.

Trawl catches continue to demonstrate the great abundance of yellow perch hatched in 1959. These fish now average about 5 inches long and should enter the commercial catch in late 1961. Trawl catches of large numbers of white bass hatched in both 1958 and 1959 indicate that a commercial production of this species should continue to be good in 1960 and 1961. The catch of 5- to 8-inch smelt in May and early June in western Lake Erie far exceeded catches during the same period in 1958-59.

Catches of fry and small fish by tow nets in May and by trawls in June revealed an exceptional hatch of smelt in the western basin this spring compared to last year. Yellow perch fry are appearing in goodly numbers but young yellow pike are relatively scarce compared to last year. Sheepshead eggs, which float on the wa-

ter's surface, have been taken earlier, in larger numbers, and over a wider area than last year. White bass, gizzard shad, and spottail shiner fry were also taken in late June.

Most yellow perch were in poor condition in May but since have fed heavily on animal plankton and now appear relatively plump. Yearling white bass (4-7 inches long) are feeding heavily on newly-hatched smelt and yellow perch. Yearling yellow pike have fed principally upon emerald and spottail shiners.

Trawling was to be continued during the summer to determine semi-monthly changes in relative abundance, growth, and food of important fish species.

M/V "George L." July 1960: Surface water temperatures were nearly constant at 75° F. in western Lake Erie during July. Average July air temperatures at Sandusky were coolest since 1947. Winds during the month were light. Low oxygen concentrations (lowest 0.5 p.p.m.) were observed in the Central and Western basins.

Commercial catches of most fish were light. Yearling yellow pike averaging 12 inches long were common in the trap-net catches in the Island Region. The largest yearling yellow pike observed was 13.7 inches long. Yearling yellow pike taken in Eastern waters (Cleveland to Dunkirk) range from about 9-11 inches long.

Ninety-two (2.3 percent) of the 4,000 yearling yellow pike tagged in April have been recovered. One fish was taken in Lake St. Clair--another taken from Lorain was the most easterly tag recovery reported.

Yearling yellow perch and white bass are very abundant in all waters of Western Lake Erie. Up to 9,000 yearling yellow perch averaging about six inches long have been observed in single trap-net catches.

Large numbers of white bass and smelt young-of-the-year were taken by trawl in July. Trawl catches of young-of-the-year yellow pike were much lower than in 1959 but appeared in somewhat greater numbers than in 1957 and 1958. The 1960 hatch averaged about 5 inches long by July 31--equal to the growth of the 1959 hatch a year ago.

The lowest total commercial catch of yellow pike on record in Lake Erie was previously reported to be 422,000 pounds in 1913, but the records for that year were incomplete. Ohio reported only the fall catches that year. Further examination of the records shows that total yellow pike commercial production in 1959 (about 1,500,000 pounds) was greater than in seven prior years (1918-21 and 1928-30). Lowest production was 744,416 pounds in 1919. Low production of yellow pike in Lake Erie, then, is not new.

Note: Also see Commercial Fisheries Review, July 1960 p. 28.

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LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 4: The fish population survey in southern Lake Michigan was continued (June 28-July 12, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Cisco.

Gangs of nylon gill nets (50 feet each of $1\frac{1}{2}$ - and $1\frac{3}{4}$ -inch mesh, and 300 feet each of 2-, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, $3\frac{1}{2}$ -, $3\frac{3}{4}$ -, and 4-inch mesh) were set overnight at 25 and 50 fathoms off Grand Haven, Mich., and at the same depths off Racine, Wis. Off Grand Haven the catch at 25 fathoms was light (314 *Leucichthys hoyi*, 2 *L. alpinae*, 1 *L. zenithicus*, 2 lake herring), but at 50 fathoms the catch was rather large (1,089 *L. hoyi*, 13 *L. reighardi*, 17 *L. alpinae*, 7 *L. zenithicus*, 9 lake herring). Off Racine the catches were very light (about 200 *L. hoyi* at each depth, 4 smelt at 25 fathoms, and 2 *L. reighardi*, 3 *L. alpinae*, 2 *L. kiyi*, and 7 lake herring at 50 fathoms).

Gangs of linen nets were set for 4 nights at 25 and 50 fathoms off Grand Haven (255 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, and 3-inch mesh at the former depth and twice that amount of each mesh size at the latter). The 25-fathom net took 151 *L. hoyi* and *L. alpinae*. An identical set at the same time of year in 1954 took 426 *L. hoyi*, 7 *L. alpinae*, 11 *L. reighardi*, and 1 *L. kiyi*. The set at 50 fathoms, with which no 1954 comparison is possible, caught 758 *L. hoyi*, 21 *L. zenithicus*, 12 *L. alpinae*, 8 *L. reighardi*, and 12 lake herring.

A 52-foot commercial-type balloon trawl was towed at 5-fathom intervals from 15 to 35 fathoms west-southwest of Grand Haven, at 30 and 40 fathoms northeast of Racine, at 25, 30, 35, 40, and 50 fathoms west of Milwaukee, and at 12, 15, and 20 fathoms near shore north of Milwaukee. All tows were for 30 minutes. The chub catches from 20 fathoms and deeper were mostly small, ranging from 60 to 250 pounds. At 15 fathoms off Grand Haven 367 pounds were caught, and at 12 and 15 fathoms north of Milwaukee, 448 and 524 pounds, respectively, were taken. The larger catches in the shallower water are accounted for by appreciably greater numbers of small (7 to 8 inches) fish than were present in the catches from deeper water. Apparently in depths greater than about 15 fathoms, a large portion of the small chubs were midwater, thus not vulnerable to the bottom trawl. The chub catches were more than 95 percent bloaters (*L. hoyi*) in all catches and were almost pure bloaters in the shallower tows. The commercial-trawl catches were practically devoid of species other than chubs, except in the 50-fathom tow off Milwaukee where 20 pounds of deep-water sculpins were caught, and in 12 and 15 fathoms north of Milwaukee, where 12 and 30 pounds, respectively, of smelt were taken.

An experimental 39-foot semi-balloon trawl with a small-mesh ($\frac{1}{2}$ -inch) cod end was towed in shallow water south of Grand Haven. At 15 fathoms, a 30-minute tow netted 285 pounds of chubs; at 10 fathoms a 10-minute tow produced small numbers of perch and about 15 pounds of very small chubs, more than half of which were less than 7 inches long. At 5 and 7 fathoms the catches were predominately yellow perch, smelt, and alewives, together with a few spottail shiners, trout-perch, and log-perch.

Complete hydrographic collections and observations were made at 25-fathom stations off Grand Haven and Racine, and at 70 fathoms in midlake between these ports. Pronounced thermal stratification existed in all areas visited, but in many cases the epilimnion was quite thin. At the end of the cruise surface temperatures were mostly 16° to 17° C. (average about 62° F.) on the west side of southern Lake Michigan and 19° to 20° C. (average about 67° F.) on the east side.

Sampling of the bottom fauna off Grand Haven was made by a Peterson dredge and a Smith-McIntyre

dredge at 5-fathom-depth intervals from 5 to 30 fathoms and at 3 and 50 fathoms. The Smith-McIntyre dredge was borrowed from the Bureau Laboratory at Woods Hole, Mass., to ascertain its suitability for use in the Great Lakes. This sampler undoubtedly operates more effectively in rough seas than does the Petersen dredge, but it is too heavy and bulky for practical use and storage aboard the *Cisco*.

M/V "Cisco" Cruise 5: The survey continued during July 19-August 2, 1960. Gangs of nylon gill nets (50 feet each of $1\frac{1}{2}$ - and $1\frac{3}{4}$ -inch, 200 feet of 2-inch, and 300 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{3}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set at 25 and 50 fathoms off Grand Haven, Mich., and off St. Joseph, Mich. Chub catches were heavier in the 25-fathom sets. Bloaters (*Leucichthys hoyi*) made up more than 95 percent of the catches, except in the 25-fathom set off St. Joseph, where about 75 percent of the chubs were bloaters. The remainder of the chubs in this latter set were rather difficult to identify, but were mostly *L. zenithicus*; there were also a few *L. alpinae* and *L. reighardi*, and a considerable number of lake herring. A few smelt and deep-water sculpins also were taken.

Linen gill nets of several mesh sizes from $2\frac{3}{8}$ - to 3-inch, set for 5 nights off Grand Haven, took about 15 to 50 percent more bloaters at 25 and 50 fathoms, respectively, than did identical gangs set in 1954 at the same time of year. For other species of chubs the following comparisons were obtained: at 25 fathoms, all were much more common in the 1954 set; at 50 fathoms, all non-bloater species except *L. kiyi* were somewhat more numerous in the 1960 set. *L. kiyi* was more common in 1954 (172 vs. 10 in 1960).

In order to study differences in gill-net catches with differences in lengths of time set, and also to determine variations in identical 1-night sets on successive nights, nylon gill nets were fished as follows: on the first day 4 gangs were set at 25 fathoms off Grand Haven; on the second day, 1 gang was lifted and reset; on the third day the 1-night set and a 2-night set were lifted, and 1 was reset; on the fourth day the 1-night set and a 3-night set were lifted, and 1 reset; on the fifth day the remaining gangs, a 1-night and a 4-night set, were lifted. Chub catches in the 1-night sets were 432, 429, 437, and 339, respectively. The 2-night set took 756 chubs; the 3-night set 1,000; and the 4-night set 1,140. The $1\frac{1}{2}$ - and 2-inch meshes (especially the latter) appeared to have lost fishing efficiency entirely after the third night, but the other larger meshes took appreciably more fish in the 4-night set than in the 3-night one.

A 52-foot commercial-type balloon trawl was towed at 5-fathom intervals from 15 to 35 fathoms northwest of St. Joseph and from 10 to 50 fathoms southwest of Grand Haven. All tows were for 30 minutes. Bloaters made up more than 95 percent of all chub catches. The chub catches off St. Joseph ranged from 110 pounds at 20 fathoms to 460 pounds at 35 fathoms. Other species taken in the trawls off St. Joseph were lake herring (27 pounds at 35 fathoms), smelt (about 5 pounds per tow at 15 and 25 fathoms), and a few perch, deep-water sculpins, and slimy sculpins. Chub catches off Grand Haven were generally light, ranging from 24 to 64 pounds at 50 and 45 fathoms, respectively, and from 296 to 256 pounds at 25 and 20 fathoms, respectively. Some 48 pounds of deep-water sculpins were taken at 50 fathoms, and 28 pounds at 45 fathoms; otherwise, there was little other than chubs in the catches.

A half-meter, large-mesh (No. 32 grit gauze) plankton net was towed for fish fry at various depths from the surface to 20 meters near shore south of Grand Haven. Very tiny fry were quite numerous at depths from 1 to 5 meters, but none were obtained in repeated tows at the surface and at depths greater than 5 meters.

Hydrographic observations and collections were made at regular 25-fathom stations off Grand Haven and St. Joseph. Phytoplankton was considerably less abundant than during previous cruises. Surface water was rather warm; temperatures were mostly between 19° and 21° C. (66.2° and 69.8° F.).

Note: Also see Commercial Fisheries Review, Sept. 1960 pp. 21-22.

* * * * *

WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

M/V "Siscowet" Cruise 3: To study the bathymetric and areal distribution of fish by systematically fishing standard gangs of experimental gill nets (1- to 5-inch mesh by $\frac{1}{2}$ -inch intervals) at various locations and depths in western Lake Superior was the objective of the second of three cruises scheduled by the U. S. Bureau of Commercial Fisheries research vessel Siscowet June 28-14, 1960.

The work was performed at four stations near Ontonagon, Mich., and at three stations in the Apostle Island region. The work also included fishing with trawls from the Siscowet and the outboard-powered skiff, and tests of an electrical boom-shocker for sampling fish in shallow areas adjacent to shore.

The "bloaters" (Leucichthys hoyi) taken in the 17-fathom set were very similar to those taken in Pike's Bay near Bayfield. This shallow-water variety has larger eyes (nearly as large as in L. kiyi), less pigment on the head, and is a heavier, more solid fish than the deep-water variety. The "bloaters" taken in the Ontonagon area also appeared to be late-winter or spring spawners. Large numbers of "bloaters" in the Apostle Island area have been observed spawning with the lake herring in the late fall.

Comparisons were made of the catch from a 1- and 2-night set at the station located at 52 fathoms and from 2 successive 1-night sets at the stations located at 25 and 72 fathoms. In each test the nets were set in exactly the same location and depth. Changing weather conditions, however, during the period may have had some effect on the results of the experiment. Only three varieties of chubs are used for the comparison that follows because of the very small numbers of other species taken.

The 2-night catch at 52 fathoms took over twice as many fish as the 1-night set. The second of two 1-night sets at 25 fathoms took 14 percent more fish than the preceding night and the second 1-night set at 72 fathoms took 26 percent more fish than the preceding night.

A 30-foot semiballoon trawl (1-inch-mesh body and a $\frac{1}{2}$ -inch-mesh cod end) fished just west of Outer Island at 9 to 25 fathoms took one 2-inch whitefish but no lake trout. The catch consisted mainly of slimy muddlers, trout-perch, and ninespine sticklebacks.

Through the cooperation of the Wisconsin Conservation Department, an electrical boom-shocker was operated at the mouth of the Bad River and in the shallow waters adjacent to Stockton Island in an attempt to locate young-of-the-year of several species. Although the shocker took no young-of-the-year, it did turn up a considerable variety of fish.

River species mainly were taken at the mouth of the Bad River—smallmouth bass, northern pike, yellow pike (yearlings), black crappie, and spot-tail shiners. No fish were taken in the lake proper off the mouth of the Bad River.

Shocking operations at Stockton Island were conducted after dark in water 3 to 8 feet deep over rock and sand bottoms. Over the rock bottom the shocker took trout-perch, 6- to 8-inch round whitefish, 6- to 10-inch burbot, and 1- to 8-inch longnose suckers. Over the sand bottom the shocker uncovered thousands of small (3 to 6 inches) smelt and 3 large brown trout, apparently in shallow water feeding on the smelt. Other species taken over the sand bottom were ninespine sticklebacks, lake northern chub, and trout-perch.

Shocking operations off Stockton Island the following morning (during daylight hours) took very few fish (slimy muddlers, ninespine sticklebacks, and burbot). No smelt were caught during the daylight fishing.

Trawl tows with the outboard skiff at 15 and 20 feet yielded only a very few ninespine stickleback and slimy muddlers.

Surface water temperatures varied from 39.6° F. northwest of Ontonagon to 59.8° F. south of Stockton Island. Bottom temperatures remained about 40° F. in all areas.

M/V "Siscowet" Cruise 4: Midsummer environmental conditions were studied July 18-25, 1960, at three index stations located southeast of Stockton Island, northeast of Bear Island, and east of Pike's Bay. These studies included fishing with standard gill-net gangs and a 30-foot semiballoon trawl. Limnological data and materials were collected including: records on water temperatures, water samples for chemical analyses, plankton and bottom samples, and Secchi-disc readings.

Secchi-disc readings were comparatively low at each station, undoubtedly due to a heavy plankton concentration in the upper layers of the water. Dissolved oxygen was found to be lowest at the surface at all stations (about 10.4 p.p.m.). The oxygen content of samples taken at or near the bottom was about 12.7 p.p.m.

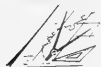
In addition to the sets made at each index station, standard gangs were fished north of Devil's Island at 37 and 58 fathoms, and east of Gull Island at 15, 25, 45, and 55 fathoms.

The lake herring caught east of Gull Island at 15 fathoms averaged $\frac{3}{4}$ -pound each. One herring measured 17.9 inches and weighed 1.8 pounds. The Leucichthys zenthius caught east of Gull Island were found to be in all stages of sexual development. Several ripe or nearly ripe specimens were observed as well as recently spent and early recovered individuals.

Trawl tows were made at each index station but catches were small in all cases. The principal species taken in the trawl were slimy muddlers, nine-spine sticklebacks, smelt, and *L. hoyi*. A $\frac{1}{2}$ -meter plankton net (32 grit cloth) was towed at the surface, 18 feet and 30 feet below the surface in 35 fathoms northeast of Bear Island. Only 1 unidentified fish larva was captured, in the tow 18 feet below the surface.

Surface water temperatures have warmed considerably since the previous cruise, ranging from 56.9° north of Devil's Island to 70.4° F. at Pike's Bay. Bottom temperatures, however, still remained at about 40° F.

Note: Also see Commercial Fisheries Review, Aug. 1960 pp. 25-26.



Gulf Exploratory Fishery Program

TRAWL FISHING GEAR STUDIED WITH UNDERWATER CAMERA:

M/V "George M. Bowers" Cruise 28 (July 14-29): Motion picture studies of shrimp trawls while being towed were continued by the U. S. Bureau of Commercial Fisheries research



The Service's exploratory fishing vessel George M. Bowers, vessel George M. Bowers during the first week of a cruise made in the Gulf of Mexico off Panama City, Fla. Motion picture film of the operation of a model experimental fish trawl was made in that area.

Due to heavy algae concentrations on the bottom, only 800 feet of underwater motion pictures were taken of a 40-foot shrimp trawl and 10-foot try net. The algae concentrations

in the trawl resulted in reducing the spread of the doors and on one occasion of tearing the net

After reports were received of ideal conditions for photographing shrimp in the Florida Keys, the vessel proceeded to that area; however, no suitable area with shrimp and favorable clean water conditions was found.

Note: Also see Commercial Fisheries Review August 1960 p. 26.



Market News Service

ADDITION OF EASTERN PACIFIC FISHING INFORMATION TO CALIFORNIA "MONTHLY SUMMARY":

The California Fishery Market News Monthly Summary, published by the U. S. Bureau of Commercial Fisheries is now issued in two parts:

Part I - "Fishery Products Production and Market Data" will continue to provide information on receipts of major California Fisheries at leading ports, packs of major canned products and byproducts, and wholesale prices. This part is issued by the

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UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF COMMERCIAL FISHERIES		
CALIFORNIA FISHERY MARKET NEWS MONTHLY SUMMARY		
JULY 1960		
Part I - Fishery Products Production and Market Data*		
California receipts of the major fisheries (including hams, marine mammals, seabirds, and water-fish at landing points) month of major canned product manufacturers of by-products; and wholesale prices for frozen and canned products; with comparative data.		
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Bureau of Commercial Fisheries Market News Service Post Office Building San Pedro, California		
* Part II - "Fishing Information", containing sea surface temperature charts, etc., is published and released from the Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 1151 Pt. Loma Station, San Diego 2, California.		

Bureau's Fishery Market News Service at San Pedro. (Requests for this part should be made to the Market News Service, U. S. Bureau of Commercial Fisheries, Post Office Building, San Pedro, Calif.)

Part II - "Fishing Information" (the first issue of which was issued in July 1960) includes monthly sea-surface temperature charts for the eastern Pacific, and fishing and research information of interest to the tuna fishing industry and marine scientists. Part II is released by the Bureau's San Diego Biological Laboratory. (Requests for this part should be made to U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.)

UNITED STATES DEPARTMENT OF THE INTERIOR	
BUREAU OF COMMERCIAL FISHERIES	
CALIFORNIA FISHERY MARKET NEWS MONTHLY SUMMARY	
JULY 1960	
PART II - FISHING INFORMATION	
Sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists	
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Addition of Part II to "California Fishery Market News Monthly Summary".....	3
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Sea-surface Temperature Charts, Eastern Pacific Ocean July 1960.....	5
Bureau of Commercial Fisheries Biological Laboratory P. O. Box 6121, Pt. Loma Station San Diego 6, California	

The Bureau established the San Diego Biological Laboratory in 1959 as its center for scientific studies concerned with tuna of the eastern Pacific. Its prime purpose is to provide for the specific application of oceanographic and biological findings to the problems of the West Coast tuna fishing industry. The laboratory is concerned alike with tropical tunas, albacore, and bluefin. This pub-

lication will be the principal medium used to disseminate information to the industry.

The monthly publication will routinely include sea-surface temperature charts. It will not always contain research and fishing information. Such will be included when there is something of significance to report.

The temperature charts cover that area of the Pacific from the Aleutians in the north to Peru and Chile in the south and offshore to 180° W. longitude. They show for each month the average sea-surface temperature and the deviations from the 30-year average and from the previous year. Between May and November, single-page supplements are issued twice monthly to show, for the immediate region off the West Coast (25° to 52° N. and offshore to 135° W.), the average sea-surface temperature for the first and last 15 days of the month. Research and fishing information indicates that the distribution of tunas and many other commercial species is directly affected by sea-surface temperatures. The charts are being prepared promptly and are expected to be most useful to fishermen in their operations. They will also benefit research scientists and meteorologists studying the oceanic environment of the eastern Pacific.

The one-page supplements will be of interest primarily to fishermen operating along the United States west coast, particularly albacore fishermen, and research agencies concerned with the coastal environment.



Maryland

BIOLOGICAL LABORATORY RECEIVES GRANT FOR RESEARCH ON EARLY LIFE HISTORY OF FISH:

Maryland's Chesapeake Biological Laboratory has received a National Science Foundation grant of \$34,700 for work on the early life stages of fish in the Chesapeake Bay and Middle Atlantic Ocean areas.

The Director of the Maryland Department of Research and Education reported on August 17 that the grant had been made for a project directed by the senior fisheries scientist at the Laboratory.

The project, to run three years, is divided into two phases. The first consists of field and laboratory work in identifying and illus-

trating the eggs, larvae, and young of various species of fishes, many of which cannot now be completely identified. The work will make it possible to locate the spawning areas of Chesapeake Bay fishes, assess their spawning survival, and determine what natural factors affect the different stages of development. When identification is definitely established, the results will be published for the benefit of other workers.

"The period shortly after eggs hatch is greatly affected by such natural conditions as temperature, salinity, and food supply. Extremes of these factors may decide whether a hatch will provide a good harvest or a poor one several years later when the fishes reach keeper size," the scientist pointed out. "Yet, we know very little about this period."

As a second phase, an atlas of drawings of fish eggs and young of those species found in the region will be compiled from published and original sources. This will be printed in a book to serve as a research tool for the identification purposes, to show where gaps of knowledge are found, and to stimulate further work in this important field. This information, unfortunately, is now scattered in many different locations and is unavailable to most individual workers.

The project proposal, which won the approval of the Foundation, noted that "Russia probably has the largest, most intensive program dealing with basic and applied studies on all phases of the biology and ecology of early fish development. Japan, India, and Italy are also much further ahead of the United States in such valuable and much-needed research." All of these countries regard their fisheries of prime importance to their economy.

The Maryland Laboratory project will go far toward plugging holes in the knowledge of younger forms, at least in this part of the nation.

The scientist and his assistants were the first to rear striped bass successfully in 1955 from the egg to the young fish, a report of which was published in 1958.

In the new activity, the scientist will be assisted by a scientific illustrator and a full-time biologist under terms of the grant. In addition, the Laboratory will provide considerable aid with other personnel and equipment.



North Atlantic Fisheries Exploration and Gear Research

ANNUAL OVERHAUL OF FISHERIES RESEARCH VESSEL "DELAWARE" HELD UP BY FREAK ACCIDENT:

The U. S. Bureau of Commercial Fisheries research vessel Delaware is stranded half way up a marine railway in New London, Conn., where she was being dry-docked for annual overhaul and for the installation of a new underwater searching device on her hull. The 147-foot vessel was stuck by the derailment of the cradle that hauls large vessels out of the water. Her predicament is challenging marine engineers and salvage experts.

The Delaware's overhaul schedule called for the installation of a new device for locating and tracking schools of fish and to spot the presence of underwater obstacles such as sandbars, shoals, sunken wrecks, etc.



Oceanography

CHARTS OF EASTERN PACIFIC OCEAN FLOOR:

Detailed maps of the ocean floor from southern California to northern Chile and several hundred miles seaward are being compiled for the benefit of the tuna fleet by the U. S. Bureau of Commercial Fisheries Biological Laboratory, San Diego, and the University of California's Institute of Marine Resources.

The maps are based upon millions of echosoundings made in the region by research vessels, mostly during the past 10 years. Much of the data have not been generally available. The topographic charts will be useful in locating tuna and also for navigation.

Frequently tuna are found in greater abundance around seamounts and deeper protuberances rising above the sea floor than in the surrounding waters. The accidental discovery of Shimada bank, off the west coast of Mexico (16° 52' N., 117° 31' W.), and the ensuing large catches of yellowfin tuna was largely responsible for the initiation of the project to analyze and plot the large amount of sounding data collected during the past decade by research vessels of Scripps Institution of Oceanography and other agencies.

A series of 24 charts covering the area from 35° N. latitude (just north of Pt. Arguello) to 24° S., and 600 to 700 miles offshore will be issued. Two charts (Nos. 1 and 3) have been distributed and the remainder will be issued on the average of once each month until completion of the series. The charts issued cover an area from the coast offshore to 12° W. longitude between 23° and 35° N. latitude. It will be determined whether there are sufficient new sounding data to warrant preparation of charts between Pt. Arguello and the Columbia River.

SURVEY OF PACIFIC OCEAN AREA OFF SAN FRANCISCO UNDER WAY:

The familiar parachute--which has for so many years used air currents to lower objects safely through the atmosphere--will take to the water to aid oceanographers in observing ocean currents in a new project announced by the Coast and Geodetic Survey, U. S. Department of Commerce, on July 31, 1960.

In mid-August the Coast and Geodetic Survey ship *Pioneer* was scheduled to explore an 8,000 square-mile section of ocean northwest of San Francisco. The project blends hydrographic and oceanographic activities into one operation.

Deep-sea soundings will be recorded while a study is made of bottom sediments, sea water temperatures, salinities, magnetic disturbances, and meandering coastal currents.

The parachutes--which are being used by the Survey on a large scale for the first time and have been used by other oceanographic scientists before--will be submerged in several areas about 50 miles offshore. Suspended at depths of approximately 16 and 1,000 feet, the big 'chutes are secured by line to surface floats and allowed to drift with

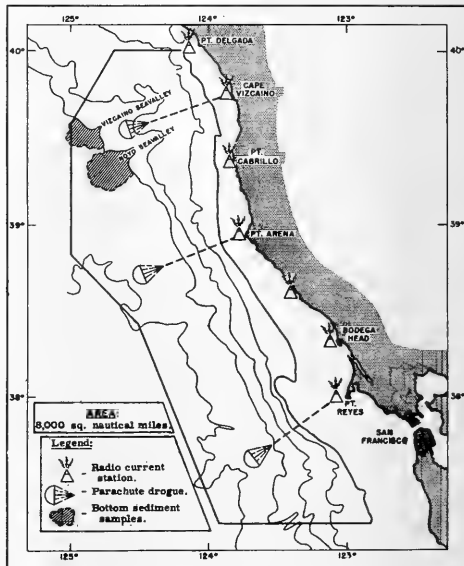


Fig. 1 - Area of oceanographic survey, season 1960 by the U. S. Coast and Geodetic Survey ship *Pioneer*.



Fig. 2 - The U. S. Coast and Geodetic Survey ship *Pioneer*.

the current. Careful tracking of the floats for a period of 48 hours will provide significant data on direction and speed of deep submarine currents.

In addition, radio current meters also will be suspended 15 feet below the surface from bright yellow buoys anchored near Pt. Reyes, Bodega Head (Calif.), Salt Point, Point Arena, Point Cabrillo, Cape Vizcaino, and Point Delgada. Information will be transmitted from the buoys to a ship recorder by radio signals.

One of the problems the Marine scientists want to solve is the varying characteristics of the coastal currents. There is a current flowing southward and parallel to the Pacific Coast with a velocity which averages about $\frac{1}{4}$ nautical mile per hour. Prevailing winds, upwelling, and other physical forces can greatly alter this flow in many areas. The Pioneer will concentrate on probing in an area between Point Reyes and Point Delgada and within 60 miles of shore.

The ship will make detailed investigations near the mouths of the Vizcaino and Noyo sea-valleys. Located about 50 miles offshore and in 7,800 feet of water, these sea-valleys are great submarine "channels" carrying vast quantities of sediment out to sea. Sediment samples will be brought to the surface and analyzed. They may give indication as to what processes are taking place along the ocean floor.

The 311-foot Pioneer is one of the largest ships in the Coast and Geodetic Survey fleet. This reassignment follows 5 years of special oceanic surveys for the U. S. Navy. Upon arrival at San Francisco on July 26, 1960, the ship terminated a 5,000-mile trackline across the Pacific Ocean from Kwajalein Atoll in the Marshall Islands to Point Buchon in California. The resulting profile of the peaks and deeps of the ocean bottom took the ship by way of Wake Island, Midway, and Oahu. Thirteen Coast and Geodetic Survey officers are assigned to the big ship.

The ocean survey near San Francisco may provide science with important new knowledge of our marginal seas. Coastal currents affect the fishing industry of California and have an influence on the weather and climate in the area.



Oysters

MORTALITIES IN CHESAPEAKE AND DELAWARE BAYS:

Disastrous mortalities have virtually wiped out the oyster industry in Delaware Bay and some nearby waters since 1957. Serious losses, although not as destructive, have also damaged the industry in the Chincoteague Bay area. Most recently, very heavy death rates are threatening large areas of Chesapeake Bay. In a paper presented at the Fifty-Second Joint Annual Convention of the Oyster Growers and Dealers Association of North America, Inc., with the National Shellfisheries Association and the Oyster Institute of North America, Baltimore, Md., July 31-August 3, 1960, the President of the National Shellfisheries Association summarized the status of oyster mortalities. The paper presented what is now known about the oyster mortalities:

- (1) A parasite of oysters, called "MSX," is present in many sick, dying, and dead oysters, and is now considered to be a major cause of deaths in Delaware and perhaps in lower Chesapeake Bay and Chincoteague Bay.
- (2) "MSX" apparently is not a fungus.
- (3) The complete life cycle is not yet known.
- (4) Even in the areas of heaviest kill, a small percentage has survived. These will be of special importance for the future.
- (5) The presence of "MSX" and other microparasites can be detected only by careful laboratory methods.
- (6) Deaths can occur within one or two months after oysters are exposed, and can spread rapidly. We do not know the method of transmission from oyster to oyster.
- (7) Deaths have been greater in high salinity areas than in low salinities, but no sharp dividing line is known. We do not know the effects of moving infected oysters into fresher waters.
- (8) The heaviest losses have involved "MSX" and other factors, for example Dermocystidium, at the same time. One parasite or unfavorable condition may make oysters more susceptible to another. The sequence is complex.
- (9) In Delaware Bay, spring-planted seed has high death rates in late summer. Summer and fall seed shows heavy loss the following spring. Some loss occurs throughout the year.
- (10) Oysters imported into Delaware Bay from many sources have all shown susceptibility. Best survival there has been by local seed from parents which lived through one or more years of exposure.
- (11) In Chincoteague Bay and the seaside area, losses have been low among oysters held for a few months, but have increased in all oysters held for a second year. Total losses have not been as heavy as in Delaware Bay.
- (12) Dermocystidium, drill loss, low oxygen, and other causes of death in various areas are still a major part of the picture and must not be overlooked.
- (13) Seaside oysters contain a micro-organism which may be a stage of "MSX" or a different parasite.

The paper then summarized future prospects as follows:

Scientists are extremely reluctant to make predictions and general statements when evidence is incomplete. This is wise and proper. At the same time, state management agencies and members of the industry are entitled to know the present thinking of biologists. They urgently need the

strongest possible basis for important decisions which cannot be deferred. If these users are willing to recognize clearly that ideas must change as new facts emerge, the research biologists are willing to try to estimate some of the future developments in the mortality problems.

- (1) Only natural control offers promise. It is probably impossible to control microparasites by chemicals or other artificial means.
- (2) Thorough basic study is essential for understanding of the parasite or parasites and methods of combating it.
- (3) Parasites will spread by natural means and by accidental transportation, and they will reach most of the areas where conditions permit them to survive. They may not yet have reached full spread.
- (4) If the Chesapeake follows the Delaware patterns, (a) the mortality will continue to spread to new areas. The rate of spread might be rapid. (b) High salinity areas will probably have heaviest losses. Note, however, that the seaside area has shown a distinctly different pattern.
- (5) Dense oyster populations are more likely to have serious mortalities than are scattered ones.
- (6) Transplants into areas of high mortality are probably futile and may be destructive to oysters already present.
- (7) Transplanting from infected areas is likely to speed up spread of the parasite.
- (8) Possibilities of spread north and south are not predictable.
- (9) Some constructive measures are possible. These include: (a) control of import and export of shells, seed, and oysters; (b) perhaps use of low salinity waters to protect stocks; (c) planting and harvesting at the most advantageous time; (d) protection of brood stock in unaffected areas from excessive depletion; and (e) maximum development of stocks in affected areas. Research and practical experience may reveal other techniques.
- (10) Selection and development of resistant stocks is probably the only way to achieve recovery in areas of high mortality. This can be greatly assisted by careful management based on sound research. It is, however, slow and expensive.

* * * * *

MSX OYSTER KILLER IDENTIFIED AS ANIMAL PARASITE:

MSX, the suspected killer of oysters which has decimated beds in Delaware Bay and some areas in Virginia, and which poses a threat to Maryland, is now tentatively identified as an animal parasite, the Maryland Chesapeake Biological Laboratory at Solomons announced on August 24, 1960. MSX previously had not been placed definitely in either the plant or animal kingdom. This statement was made after examination of hundreds of slides from infected oysters by two parasitologists. Their work at the Laboratory is part of Maryland's contribution in an all-out cooperative effort to learn as much as possible about the parasite.

One of the parasitologists has found that MSX cannot be identified as one of the plant-like pathogens and does not have the characteristics of any known plant-like organism. By elimination, this places the organism as an animal parasite, and the matter of identification a problem for animal parasitologists.

The term MSX is scientific shorthand for "Multinucleate Sphere X." When the name was coined some time ago at Rutgers University, all that was known about the suspected oyster killer was that it was spherical, had several nuclei, and could be seen only through a microscope. Little else was known about its identity—hence the "X" factor. About 5,000 of the tiny spheres lined up in a row would extend about one inch. However, one further thing is certain: MSX is not harmful to humans—only to oysters.

A staff member who recently joined the Chesapeake Biological Laboratory is especially interested in the Sporozoa, a group of minute animal parasites to which it is now thought MSX may belong. He cautioned that much more must be learned about the identity of the organism, and that little is known about how MSX operates as the suspected killer of oysters. Certain information is on hand, however, to show how similar animal parasites cause harm to their hosts.

Teams of scientists at Rutgers University, the Virginia Fisheries Laboratory, the U. S. Bureau of Commercial Fisheries in Annapolis, and the University of Delaware were for some time being making a vigorous attack on the problems relating to MSX.

The Chesapeake Biological Laboratory has instituted a similar research program, conducted in cooperation with the other institutions. This combined approach is the largest ever mounted against a threat to coastal shellfish.

The Laboratory's shellfish program is attacking a number of other phases of the MSX problem. Fourteen outposts have been established in the Maryland Chesapeake area and in the Chincoteague area where oyster bars and test trays provide oysters which are examined under microscopes. These will give warning in case MSX advances northward from Virginia.

The assembled scientific talent, though concentrating on MSX, is taking advantage of the opportunity to study more fully other oyster predators such as mud worms, oyster drills, crabs, *Dermocystidium* (a fungus which functions similarly though not so devastatingly as MSX), and the so-called SSO (Seaside Organism) found in Virginia. SSO may, it is felt, be simply one stage in the life cycle of MSX.

Steps in combating a harmful organism about which little is known were described by the Laboratory Director as follows:

"First, the killer must be identified. Its life cycle must be learned—its appearance in various stages of development, how it is transmitted from one oyster to another, how it spends the winter. Perhaps we can interrupt the life cycle at some point—or perhaps not.

"Failure to interrupt the life cycle would leave us dependent upon the locating and encouraging of the few survivors, the mortality-resistant oysters. In any kind of living organism there are nearly always certain individuals which, like the flies that resist DDT and the human bacteria that resist penicillin, can form the nucleus of a new population.

"While our research in Maryland will be of value elsewhere, we are still hopeful that it won't be needed here. We are fortunate in that MSX appears to prefer saltier waters; however, it may adapt to the upper Chesapeake Bay's fresher water in time. We are therefore bound to learn all we can as soon as we can. We must maintain constant watch."

* * * * *

MARYLAND OBSERVATIONS, 1960 SEASON:

Maryland oyster setting this season has been later than usual and has been sparse, according to the July 27, 1960, *Special Oyster Bulletin* of the Maryland Chesapeake Biological Laboratory. Salinity during late

spring and early summer averaged about 20 percent less than normal. Temperatures were much lower than normal in early spring but were near the normal during early summer. Temperature and salinity of the water in the Holland Straits area for the first three weeks in July averaged about 79° F. and 12.7 o/oo, respectively.

The continued high oyster mortalities in Delaware Bay and in certain portions of the lower Chesapeake are of major concern.

At the tray stations and during a spring survey, oysters appeared to be normal in the Maryland portions of the Chesapeake except for some losses at Cinder Hill where a number of known adverse causes affected survival. The organism termed "MSX," that is associated with Delaware Bay mortalities, has not yet been found in Maryland Chesapeake Bay oysters although it has been found on the seaside. However, preparation and examination of material for detection of this parasite are very time-consuming and a large backlog of collections remains that has not yet been checked.

The Virginia Department of Tidewater Fisheries, the Maryland Department of Research and Education, and the U. S. Bureau of Commercial Fisheries cooperate in making counts of commercial oyster set in the fall and succeeding months in the Chesapeake Bay area.

Maryland oyster setting has remained light at most stations where observations are made, according to the August 19, 1960, Special Oyster Bulletin.

Water temperatures probably reached their peak (79° to 86.5° F. during the first three weeks in August) and salinities remained lower than normal.

The combination of high temperature and copious rainfall caused a strong stratification of the water with oxygen-poor (stagnant) water conditions in deep water reaching up nearer to the surface than normal.

Steady winds crossways of the Bay can cause the pool of stagnant water to tilt over towards either side of the Bay. When it overlies oyster beds for a sufficiently long period it may cause anaerobic conditions to develop at the bottom, accompanied by the generation of hydrogen sulphide, a gas smelling like rotten eggs. This gas is poisonous

and adds further to bad environmental conditions that may kill oysters, crabs confined in pots, and bottom-feeding fish. Heavy blooms of certain minute organisms sometimes cause patches of discolored water or "red tides" that add to the unfavorable conditions. No reports of damage have been made this season and it is probable that better mixing soon will restore oxygen levels to normal.

Heavy mats of a foreign species of seaweed, a water milfoil, are causing an increasing problem to oyster growers in certain tributaries of the Potomac. This problem is expected to increase with spread of the pest.

Oysters held on trays have shown no unusual mortality thus far except in Holland Straits, where oyster losses have continued higher than at other stations. Preparation and examination of material to determine the presence of "MSX," the parasite associated with the Delaware Bay mortalities, are in progress and are being rapidly stepped up as new equipment has been put into use.

The fungus parasite, *Dermocystidium*, has shown a rather high incidence on Cinder Hill during the past few weeks and undoubtedly is causing some of the oyster mortality observed there.

* * * * *

VIRGINIA'S YIELD PER ACRE ALMOST TREBLE THAT FOR MARYLAND:

At the August meeting of shellfish scientists and oyster growers in Baltimore, Md., a speaker from Crisfield, Md., stated that the Japanese are harvesting 80,000 pounds of oysters per water acre as compared to 50 pounds per acre in Maryland.

In contrast to the very low yield per acre in Maryland, the Information Officer for the Virginia Fisheries Laboratory points out that production on leased and planted oyster bottoms in Virginia is usually much higher than the estimates for Maryland. According to statistics compiled by the U. S. Bureau of Commercial Fisheries, the average production in Virginia for oyster planters is about 163 pounds per acre. This does not take into account the many acres of oyster grounds leased, but not cultivated. If the actual amount of uncultivated grounds were known, Virginia oyster production would probably be shown much higher.

Approximately 128,216 acres of oyster grounds are rented to oyster farmers in Virginia. Although these oyster-growing bottoms are admittedly inferior to the public rocks and might be compared to submarginal farm land, they produce nearly five times as many oysters as are harvested from the 200,000 acres of public grounds.

Research conducted by the Virginia Fisheries Laboratory has benefited planters in helping them make the best use of the ground they rent. The Laboratory has prepared for distribution a booklet, Let's Be Oyster Farmers, to make information available to oyster farmers throughout Virginia.

* * * * *

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING:

As of August 10, 1960: Since the latter part of July, the bottom water temperature has increased several degrees in Long Island Sound and now ranges between 70.5° F. and 73.0° F. Examination of U. S. Bureau of Commercial Fisheries plankton samples, each retaining material screened from 200 gallons of water, again showed that oyster larvae are extremely uncommon. No mature oyster larvae were found in the Milford and New Haven areas from August 1 through August 8. In the Bridgeport area, one mature oyster larva was found on August 4, and three larvae were observed on August 8. The latter sample also included a large number of larvae of the wood-boring bivalve, Teredo, a condition indicating that the water mass probably came from the Housatonic River.

The absence, or near absence, of bivalve larvae, in general, and especially oyster larvae, is correlated with the plankton blooms that have been apparent in our water this summer, according to the biologists. As mentioned before, these blooms are responsible for large patches of "red water" that are caused by microscopic organisms, most of which belong to three groups, namely, Prorocentrum, Gymnodinium, and Gyrodinium.

Oyster setting continues to be extremely light. Between August 4 and August 8 it occurred only at four stations at the rate of 2 to 3 spat per 20 shells.

Starfish setting continues. However, it has shown a very sharp decrease since July 24. At present it is light and irregular, and

has occurred during the last four days at only approximately half of the Bureau's stations. (Bulletin No. 4, August 10, 1960, U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.)

As of August 23, 1960: The bottom water temperature of the oyster-producing section of Long Island Sound remained quite steady during the two weeks preceding August 23, 1960, and, as of that date, it ranged between 71.0° F. and 74.0° F. During the same period the water conditions gradually improved because fewer dinoflagellates that are responsible for "red water" were present. On August 22, no conspicuous patches of "red water" were observed within the entire New Haven-Bridgeport area, where the U. S. Bureau of Commercial Fisheries stations are located.

Parallel with the improvement in the water conditions, the numbers of bivalve larvae, including those of oysters, began to increase. Plankton samples collected about August 15 showed oyster larvae present in all three areas, i.e., New Haven, Milford, and Bridgeport. Although found at all stations, they were present in small numbers and were of different sizes, thus indicating that this was not a large, single brood that would give a heavy setting of short duration but a mixture of many broods that will result in a continuous but light setting.

Bivalve larvae continued to be present in fair numbers on August 22. They were most numerous at one station located at a 30-foot depth in the Bridgeport area, where a total of 23 mature oyster larvae were found in a 200-gallon sample. This is rather a substantial number of old larvae, probably indicating that a considerable increase in the intensity of setting may be expected at least in the Bridgeport area.

Oyster setting continued at most of the stations but remained light, although during the week preceding August 23 its intensity somewhat increased, especially at one station in the New Haven area and one station located in comparatively shallow water on the Bridgeport natural bed. Upon examination of the collectors brought in on August 22 the most promising aspect was that the majority of the recently-set oysters were only a day old or younger. This circumstance also indicated that an increase in intensity of oyster setting should be expected.

Contrary to the increase observed for oyster setting, setting of starfish showed a decline. For example, between August 18 and August 22, the last collecting period, only a single starfish spat was found per 40 shells at two stations, while the collectors from other stations were entirely free of young starfish. (Bulletin No. 5, August 23, 1960, U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.)

* * * * *

UNDERWATER HARROW MAY AID STARFISH CONTROL ON OYSTER BEDS:

In connection with the development of the underwater harrow by the Milford Biological Laboratory of the U. S. Bureau of Commercial Fisheries as a mechanical method of



Fig. 1 - A type of underwater harrow used as a mechanical method of control of oyster enemies.

control of oyster enemies, experiments are in progress to determine what happens to starfish covered by mud. Three types of substratum were used: mud, shells and mud, and sand. In mud, starfish buried in one inch could not emerge and died in 3 to 4 days at a temperature of about 10° to 12° C. (50°-53.6° F.), and in 2 or 3 days at a somewhat higher temperature. When starfish were covered with mud so that only one or two of their rays protruded in the open, only approximately 20 percent could emerge. The others died.

More or less similar results were observed using shells and mud and sand. In general, however, starfish die faster in mud.



Portion-Control Fishery Products

USE IN INSTITUTIONAL AND PUBLIC EATING PLACES:

Use of portion-controlled fish products by institutional and public eating places is definitely increasing. This was one of the findings of a survey conducted in ten selected cities by Crossley, S-D Surveys, Inc., for the U. S. Bureau of Commercial Fisheries to determine how much frozen fish, shellfish, and portions were purchased and served in restaurants and institutions.

In each of the ten cities surveyed, more than 10 percent of establishments using portions reported greater purchases of portions compared to the previous year. More than half of the purchasers in Springfield, Mass., said they were buying more. In Denver 47 percent of the users reported buying more.

"Convenience and ease of preparation" of portions was the most often cited advantage over other types of frozen processed fish. User establishments ranked "convenience" first in six of the 10 cities and second in the other four. "Uniformity and size" of portion held first place in three cities--Atlanta, Cleveland, and New York City; "fast and time-saving features" were most often cited by Los Angeles eating places.

Cost of using portions, as compared to other frozen processed fish, was considered less expensive or about the same by a wide majority of establishments in all cities except Springfield. About 51 percent of the Springfield users said they were more expensive compared with the 22 percent reporting them to be less expensive. In four cities--Chicago, Cleveland, Houston and Omaha--90 percent of the establishments using portions considered them no more expensive than other forms of frozen processed fish.

Omaha ranked first among the ten cities in terms of percentage of all establishments buying frozen processed seafood. Atlanta was second and New York City was last. Omaha and Atlanta also ranked at the top by percentage of establishments purchasing portion-controlled fish products, with 27 percent of users in each city buying portions.

Frying was the leading method of preparing all types of frozen processed fish prod-

ucts in the ten survey cities. It was also the leading method for preparing portions in all of the cities except Springfield, where baking was more popular.

In all cities, a majority of establishments using portions cooked them while frozen. This ranged from highs of 59 percent in Chicago to 92 percent in Omaha. Breaded portions were the most popular portion items.



Uncooked-breaded portions were the leading type of portion-controlled fish product in 8 of the 10 cities in terms of the percentage of establishments using them. The two exceptions were New York City and Springfield, where portions were most frequently bought cooked-breaded.

Uncooked-plain portions ranked high in Chicago and Cleveland and the quantity purchased was greater than that of any other type. Quality of portions was generally considered satisfactory by nearly all establishments in all cities.

There were a variety of disadvantages to using portions cited by users in each city, although a majority specified no disadvantage.

The size of portions in a package was considered satisfactory by almost all establishments in the 10 cities.

The majority of the portion users said they specified the kind of fish when ordering portions. A very small percentage of the portion users suggested new portion items, not available, which they would like to have.



North Atlantic Fishery Investigations

UNDERWATER TELEVISION AIDS BIOLOGISTS IN FISH BEHAVIOR STUDIES:

Biologists at the U. S. Bureau of Commercial Fisheries' Woods Hole Biological Laboratory now are able to extend their studies with the help of underwater television

to include observations of fish as they are caught in otter trawls. The specially-designed television camera is suspended within the cod end of the trawl and the image transmit-



ted over a coaxial cable to a receiver on board the vessel. Continuous observations or motion-picture recordings of the fish in the submerged net can be made by biologists in the comparative comfort of a shipboard laboratory.

A major problem in large mesh or savings-gear studies has been the behavior of fish in the trawl. The questions raised by the biologists are (1) do the small haddock or other commercially valuable species actually try to escape through the meshes; or (2) do non-commercial varieties clog the meshes, thus blocking the escape of immature food fish. Underwater television will now help to supply answers to these and other questions.

Careful analysis of motion picture recordings of the television screen has uncovered some interesting facets of species differences in behavior. For example, haddock seem to explore the confined area within the cod end, crossing from one side of the trawl to the other. In contrast, sand lance, an important marine forage species, seem in a hurry to escape through the meshes and usually do so in very rapid fashion.

Many future underwater television studies are planned by the Laboratory. One such study will examine the relationship between the swimming ability of fishes and the speed of the trawl moving over the ocean floor.



South Atlantic

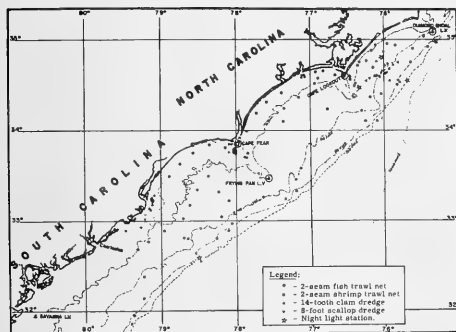
Exploratory Fishery Program

SAVANNAH RIVER-CAPE HATTERAS OFFSHORE AREAS SURVEYED FOR FISH AND SHELLFISH RESOURCES:

M/V "Silver Bay" (Cruise 25)! The offshore area (5-100 fathoms) from the Savannah Riv-

er, Ga., to Cape Hatteras, N. C., was surveyed for stocks of clams, scallops, shrimp, and fish by the U. S. Bureau of Commercial Fisheries chartered exploratory fishing vessel Silver Bay, July 13-30, 1960.

In 29 drags with a 14-tooth Fall River clam dredge, scattered individual live clams (*Venus mercenaria*) and dead shells were taken in the vicinity of Bogue Inlet and Cape Fear. No live shells were taken in the vicinity of Cape Romain.



M/V Silver Bay Cruise 25 (July 13-30, 1960).

A total of 18 drags with an 8-foot modified Georges Bank scallop dredge, with a $1\frac{1}{2}$ -inch mesh liner (to determine the seasonal availability of calico scallops in known areas), east of Core Banks, produced catches up to 19 bushels per half-hour drag. The best catches were made in the 20- to 21-fathom depth range. The scallops were large (about 2.4 inches average), but the yield per bushel was only $2\frac{1}{2}$ pints as compared with about 5 pints in September.

Inside the 10-fathom curve, 27 drags produced only scattered individual brown shrimp, *Penaeus aztecus*, and pink shrimp, *Penaeus duorarum*, except for one 40-pound catch of 26 to 30-count per pound headless brown shrimp in a one-hour drag.

Surface trolling at intervals between trawling stations resulted in the capture of king mackerel (*Scomberomorus cavalla*), dolphin, (*Coryphaena hippurus*), and white skipjack (*Katsuwonus pelamis*).



Telephone and Telegraph Cables

CHARTS SHOW CABLES IN NORTHWEST ATLANTIC:

Charts showing the exact routes of telephone and telegraph cables in the Northwest Atlantic Ocean area are now being made available for the first time to fishermen.

The cable companies hope the release of the detailed charts will help to prevent trawling damage to the cables--the mainstay of telephone and telegraph communications between North America and Europe.



Tuna

COMPOSITION STUDIES:

Research on the composition of tuna has been under way in the Seattle Technological Laboratory of the U. S. Bureau of Commercial Fisheries for more than a year. It has been determined that compared to some other salt-water species of fish, the tuna and tuna-like fish are low in moisture and sodium, and high in protein. Oil content is variable, ranging from 1-15 percent. The study involves the collection of two series of 10 fish each, taken each season over a period of three years. Samples are prepared from the light and dark meat of nape, center, and tail steak sections taken from each fish.

The investigation of albacore tuna is in its second year, skipjack tuna in the first year. Exploratory composition work has also been done on both bluefin and yellowfin tuna.

TROLLING PROGRAM AIDS PACIFIC COAST ALBACORE FLEET:

The cooperative program arranged by the U. S. Bureau of Commercial Fisheries and the U. S. Navy at the five picket stations along the West Coast, whereby trolling gear was fished almost daily from the vessels occupying those stations, proved effective in helping to locate the first incoming albacore tuna schools this season and in relaying the information to the United States albacore fleet. When catches were heavy or large schools were sighted, the Bureau was notified

by a radio message through Fleet Weather Facility, San Diego.

In addition to the Navy trolling program, the Bureau's research vessel Black Douglas of the La Jolla Biological Laboratory and research vessels of the Scripps Institution of Oceanography undertook a similar trolling program while on marine life research cruises. Invaluable information was obtained regarding the early season distribution of albacore this year.

Albacore fishermen's groups were alerted continually concerning catch and distribution information received as a result of the trolling program.



United States Fishing Fleet^{1/} Additions

During June 1960, 68 vessels of 5 net tons and over were issued first documents as a fishing craft--a decline of 19 vessels as compared with the same month of last year. The

Table 1 - U. S. Vessels Issued First Documents As Fishing Craft By Areas, June 1960

Area	June		Jan. - June		Total
	1960	1959	1960	1959	
(Number)					
New England . . .	6	1	12	8	15
Middle Atlantic . .	1	2	9	5	12
Chesapeake	15	11	38	45	106
South Atlantic . . .	7	13	27	44	76
Gulf	16	25	43	76	135
Pacific	20	20	71	59	97
Great Lakes	3	2	7	5	6
Alaska	-	13	14	20	32
Total	68	87	221	262	479

Note: Vessels assigned to the various areas on the basis of their home ports.

Pacific led with 20 vessels, followed by the Gulf with 16, and the Chesapeake with 15. The South Atlantic, New England, Great Lakes, and the Middle Atlantic areas represented the remaining 17 vessels.

During the first six months of 1960, a total of 221 vessels were issued first documents as fishing craft--41 less than were reported dur-

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft By Tonnage, June 1960

Net Tons	Number
5 to 9	42
10 to 19	13
20 to 29	6
30 to 39	1
40 to 49	2
100 to 109	1
130 to 139	1
230 to 239	1
270 to 279	1
Total	68

ing the same period of 1959. Most of the decline occurred in the Gulf area where 33 fewer vessels were documented in the first six months of 1960 as compared with the same period of 1959.

^{1/}Includes both commercial and sport fishing craft.



U. S. Fish Meal and Solubles Production and Imports, January-June 1960

During the first six months of 1960, the United States production of fish meal amounted to 74,024 tons, compared with 92,471 tons for the same period in 1959. An even greater decline occurred in imports, from 100,701 tons for the first half of 1959 to 66,375 tons for the first half of 1960.

Similar declines occurred in the production and imports of fish solubles. The January-June 1960 production of 33,722 tons of solubles was 25,166 tons less than for the

Table 1 - U. S. Supply of Fish Meal and Solubles, 1960 and 1959

Item	January-June		Total
	1960	1959	
(Tons)			
Fish Meal:			
<u>Domestic production:</u>			
Menhaden	54,370	69,945	223,893
Tuna & mackerel	11,520	10,528	25,380
Other	8,134	11,998	57,278
Total production . . .	1/74,024	1/92,471	306,551
<u>Imports:</u>			
Canada	21,930	30,099	39,033
Peru	32,889	36,884	49,923
Chile	7,393	4,995	5,104
Angola	-	20,738	20,738
Union of So. Africa . . .	3,905	2,422	9,727
Other countries	258	5,563	8,400
Total imports	66,375	100,701	132,925
Available fish meal supply	140,399	193,172	439,476
Fish Solubles (wet weight):			
<u>Domestic production</u> ^{2/}	33,722	58,888	165,359
<u>Imports:</u>			
Canada	615	966	1,660
Denmark	1,858	8,547	18,723
Other countries	45	312	6,247
Total imports	2,518	9,825	26,630
Available fish solubles supply	36,240	68,713	191,989

^{1/}Based on reports from firms which accounted for 92 percent of the 1959 production.

^{2/}Includes production of homogenized-condensed fish.

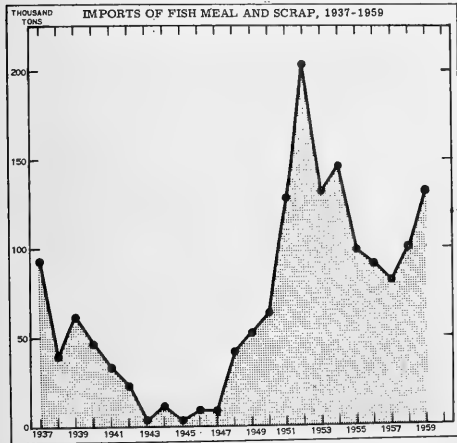
same period the previous year. Imports of solubles the first half of 1960 amounted to 2,518 tons, compared with 9,825 tons for the first half of 1959.



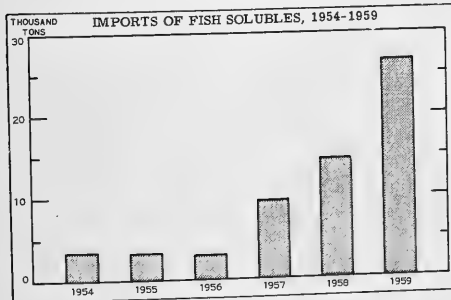
U. S. Foreign Trade

IMPORTS OF FISH MEAL AND SCRAP, 1959:

Total imports of fish meal and scrap entering into the United States during 1959 amounted to 132,925 short tons, valued at \$15.9 million--an increase of 32 percent in quantity over 1958.



Fish meal and scrap imported into the United States from Peru during 1959 led in volume with 49,923 tons. Canada was second with 39,033 tons, followed by Angola with 20,738 tons. Those countries provided 83 percent of total United States imports.



The year 1952 was a record year both in volume and value when 203,539 tons of fish meal and scrap, valued at \$24.3 million, were imported into the United States. In that year Norway led all other countries in meal and scrap shipped to the United States with a total of 50,181 tons. Canada was second with 40,152 tons, followed by the Union of South Africa with 37,523 tons.

United States imports of fish solubles in 1959 amounted to 26,630 tons, valued at \$2.2 million. Compared with 1958 this was an increase of 12,063 tons and \$900,800.

EDIBLE FISHERY PRODUCTS, JUNE 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during June 1960 increased by 5.6 percent in quantity and 5.0 percent in value as compared with May 1960. The increase was due primarily to higher imports of groundfish fillets (up 1.3 million pounds) and fresh and frozen lobster (up 1.4 million pounds), and to a lesser degree, an increase in the imports of canned tuna in brine, frozen tuna other than albacore, and fresh and frozen salmon. The increase was partly offset by a 1.6-million-pound decrease in the imports of frozen albacore tuna, and frozen shrimp (down 1.0 million pounds).

Compared with June 1959, the imports in June this year were up by 7.8 percent in quantity and unchanged in value due to higher imports of frozen albacore and other tuna (up 4.0 million pounds), groundfish fillets (up 1.5 million pounds), and fresh and frozen lobster (up 1.1 million pounds). Compensating, in part, for the increases was a drop of about 0.9 million pounds in the imports of fresh and frozen salmon and canned salmon (down 0.6 million pounds).

Item	QUANTITY			VALUE		
	June 1960	June 1959	Year 1959	June 1960	June 1959	Year 1959
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish: Fresh, frozen, & processed ^{1/}	86.3	80.1	1,070.5	27.2	27.2	309.6
Exports:						
Fish and shellfish: Processed only ^{1/} (excluding fresh & frozen)	1.5	4.5	68.0	0.8	1.3	22.8

^{1/} Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in June 1960 were lower by 16.3 percent in quantity and 33.3 percent in value as compared with May 1960. Compared with the same month in 1959, the exports this June were down by 66.3 percent in quantity and 38.5 percent in value. The drop in exports in June this year as compared with the same month in 1959 was due to sharply lower exports of California sardines and squid and miscellaneous fresh and frozen fish to Canada.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the 12½-percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-July 30, 1960, amounted to 26,754,852 pounds, according to data compiled by the Bureau of Customs. From January-August 1, 1959, a total of 26,535,173 pounds had been imported.

* * * * *

EXPORT EXPANSION PROGRAM AIDED BY EXPORT-IMPORT BANK:

In implementation of the National Export Expansion Program, officials of the Export-Import Bank of Washington have provided a description of progress in the operation of medium-term export financing. An innovation in this field was devised by the Bank to give assistance to the United States exporter through flexibility in Bank procedure. Here, the Bank will place sole reliance upon the credit judgment of the participating commercial bank if the commercial bank will finance as much as 10 percent of the invoice value of the sale without recourse to the exporter. The innovation acts as a time saver, since the exporter may deal only with his commercial bank. To date, 43 of these transactions have been approved by the Bank for export sales invoice values of \$5.4 million.

Another point described was the new Export-Import Bank short-term political risk program. In this, the Bank covers short-term transactions which are not in excess of 180 days against non-commercial risks such as inconvertibility of funds, war and civil commotion, cancellation of import license, im-

position of foreign laws, and the expropriation of goods. Services of United States commercial banks and commercial export credit insurance companies have been enlisted by the Bank to act as issuing agents for the guarantees. To date 68 political risk guarantees have been issued under the program for an export volume of \$38 million, and 142 issuing agents have been authorized.



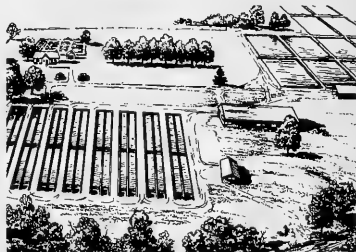
Washington

SALMON PLANTED BY HATCHERIES EXPECT TO SET RECORD IN 1960:

The state of Washington's stepped-up program to aid its salmon fisheries through expansion of salmon rearing in hatcheries and fish farms is showing steady progress, the Director of State's Department of Fisheries announced on August 15. Salmon plants the first half of this year totaled more than 73 million fish--the largest number ever released in the state during a similar period, the Director said.

Hatchery ponds still hold a total of 17,216,112 young salmon, therefore with releases the balance of the year there is a strong possibility that salmon plants this year will surpass the all-time record of 77,491,127 set in 1959.

Releases so far this year have been made in virtually all salmon streams in the State, as well as in a number of fish farms. The great majority of the fish had been reared for



varying lengths of time in the State's 22 salmon hatcheries. This rearing before release results in larger, hardier fish, that have a much better chance of survival than if planted immediately after catching.

Most of the fish-farm plants have been of fingerling-sized salmon, the Director said, reared about 90 days in hatchery ponds. Many of the fish-farm plants have shown phenomenal growth in the predator-free, naturally-enriched areas, resulting in seaward-bound migrants much larger than "wild" salmon migrating to sea.

Of the 73,607,804 young salmon planted so far in 1960, fall chinook was the largest single species, with 50,080,933 fingerlings, 24,768 yearlings, and 4,640,130 fry of that species released. Past experience has shown that plants of fall chinook bring the greatest returns, both in numbers of fish and in poundage, along with being one of the most desired species by both sport and commercial fishermen.

Next largest group was silver salmon, 1,936,907 fingerlings and 8,383,881 yearlings

planted. More than 7 million chum salmon were released--1,036,064 fry and 6,069,566 fingerlings. Pink salmon plants totaled 832,086--8,190 fry and 832,896 fingerlings. Spring chinook plants totaled 603,469--466,500 fingerlings and 136,969 yearlings.

Poundage total for the first six months of this year reached 384,202 pounds, compared to a total of 446,963 pounds of salmon planted during the entire year of 1959.



Wholesale Prices, August 1960

The mid-August 1960 wholesale price index for edible fishery products (fresh, frozen, and canned) at 124.4 percent of the 1947-49 average was down 4.2 percent from the preceding month, but was higher by 3.8 percent as compared with the same month in 1959. The decrease from July to Au-

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, August 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices ^{1/}		Indexes (1947-49=100)			
			(\$)		1947-49	July 1960	June 1960	Aug. 1959
			1960	1960	1960	1960	1960	1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					124.4	129.9	126.5	119.8
Fresh & Frozen Fishery Products:					138.5	147.7	142.0	132.8
Drawn, Dressed, or Whole Finfish:					158.1	165.1	149.7	152.2
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.09	.14	88.9	136.8	88.3	109.1
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.36	.34	109.9	106.2	103.7	107.8
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.90	.88	202.2	198.0	189.3	179.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.64	.63	158.7	156.2	141.3	158.6
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.74	.68	149.7	136.6	166.9	161.8
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.73	.68	170.0	158.3	155.9	193.5
Processed, Fresh (Fish & Shellfish):					131.6	146.0	144.8	121.5
Fillers, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.27	.46	90.2	154.8	125.9	125.9
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.68	.79	106.6	124.8	128.8	101.1
Oysters, shucked, standards	Norfolk	gal.	7.00	7.00	173.2	173.2	170.1	148.5
Processed, Frozen (Fish & Shellfish):					112.6	117.8	118.4	112.3
Files: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	102.1	100.8	102.1	98.2
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.27	.27	84.8	84.8	78.5	102.0
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.27	.27	108.7	106.7	110.8	108.8
Shrimp, lge. (26-30 count), 6-lb. pkg.	Chicago	lb.	.72	.79	111.5	121.5	123.8	106.5
Canned Fishery Products:					104.8	104.8	104.8	102.0
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	24.50	24.50	127.8	127.8	127.8	123.9
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.10	11.10	80.0	80.0	80.0	77.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	8.00	8.00	93.9	93.9	93.9	88.1
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	93.1

^{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.

gust this year was due primarily to sharply lower ex-vessel prices for haddock at Boston and lower fresh and frozen shrimp prices. Prices this August were higher than a year earlier because of higher prices for fresh and frozen halibut, fresh salmon, shucked oysters, fresh and frozen shrimp, and canned fish.



Boxed fish ready for loading and shipping at Fulton Fish Market, New York City. Open box in front is ready to be filled with ice before lid is nailed on.

The wholesale price index for the drawn, dressed, and whole finfish subgroup this August declined 4.2 percent as compared with the preceding month--the sharply lower (down 35.0 percent) mid-August 1960 large haddock prices at Boston were responsible for the drop. All other subgroup items were priced higher. However, the August 1960 subgroup price index was up about 3.9 percent as compared with

the same month in 1959, due to higher fresh salmon prices (up 12.5 percent) and a 1.9-percent increase in fresh halibut prices. Substantially lower prices for fresh large drawn haddock (down 18.5 percent) and fresh-water round whitefish (down 7.5 percent) and yellow pike (down 12.1 percent) at New York City failed to offset the increases.

The fresh processed fish and shellfish subgroup wholesale price index this August declined 9.9 percent from the preceding month. Due to good supplies of small haddock at Boston, the index for fresh small haddock fillets dropped 41.7 percent. This plus a seasonal decline (14.6 percent) in fresh shrimp prices at New York City were responsible for the decline from July to August in this subgroup. From August 1959 to August this year, the subgroup index rose 8.3 percent due to higher (16.6 percent) shucked oyster prices and higher (5.4 percent) fresh shrimp prices. These increases more than offset the sharply lower (down 28.4 percent) prices for fresh small haddock fillets at Boston in mid-August this year.

The wholesale price index for the frozen processed fish and shellfish subgroup dropped 4.4 percent this August from the preceding month. Lower frozen shrimp prices (down 8.2 percent) at Chicago more than offset increases of about 1/2 cent a pound for flounder and ocean perch fillets. Frozen haddock fillet prices were unchanged. From August a year ago to this August, the subgroup price index was almost unchanged (up 0.3 percent). Lower prices for frozen small haddock fillets (down 16.9 percent) were just about balanced out by an increase of 4.7 percent in frozen shrimp prices and a 3.4-percent increase for frozen flounder fillets.

The canned fish subgroup price index in August 1960 remained unchanged from the preceding month and has shown little change over the past 12 months. Prices for all canned fish items (except for Maine sardines) were higher this August as compared with August a year ago. At the end of August 1960, the pack of Maine sardines was trending slightly higher than at the same time in 1959, but the prospects for a fair pack of pink salmon remained very poor. The packing season for California sardines, which opened on August 1 in Central California, started off poorly but picked up some by the end of the month. The major packing season for that species began on September 1 when the Southern California fishing season opened. Raw material for the tuna canning industry remained plentiful with the market, both in the United States and worldwide, somewhat oversupplied.



NOISES MADE BY SHRIMP

Some species of shrimp, notably the snapping shrimp, make very loud noises. These are sufficiently common to cause considerable difficulty to people operating underwater instruments. The commercial shrimp of the species *Penaeus* caught in Gulf of Mexico waters do not appear to make any sounds other than a very faint rustling caused by their movements. Attempts have been made to discover some distinctive sounds made by these animals to assist their capture, but without success. The U. S. Bureau of Commercial Fisheries is engaged in further research in this field.



FOREIGN

International

BERING SEA

U. S. NAVAL OBSERVATIONS ON SOVIET FISHING FLEETS:

United States Navy planes from Kodiak or Adak, in the Aleutian Chain, Alaska, regularly observe fishing fleets in the Bering Sea while on routine flights. Planes have reported a large number of U.S.S.R. vessels conducting fishing operations in the North Pacific.

All during the winter, the Russian fishing fleets hug the ice pack in the Bering Sea. They have factoryships and reefers (refrigerator ships) coming and leaving the year-round.

There are maybe 4 or 5 motherships, with perhaps ten trawlers each, spaced across the Bering Sea.

Soviet whalers worked both sides of the Aleutians.

FISH OILS

WORLD FISH OIL EXPORTS SET NEW RECORD IN 1959:

World exports of fish oils (including fish-liver oils) reached a record 265,000 short tons in 1959, reflecting rising United States exports, record shipments from West Germany, Denmark, and the Union of South Africa, and the emergence of Peru as an important world exporter. Exports in 1959 were one-third above 1958 and were almost double the 1935-39 average.

Following two years of sharply declining exports, shipments of fish oil from the United States in 1959 rose to a new peak of 72,200 tons, exceeding the previous record of 71,300 tons shipped in both 1955 and 1956. United States exports to Europe were up 74 percent from 1958 and accounted for virtually all of those exports. The larger European imports of fish oil stem from an increased demand for all fats and oils following general stock depletion during 1958. Canadian exports were also up sharply in 1959 as a result of a return-to-normal output late in 1958 and throughout most of 1959.

Although several European countries export sizable quantities of fish oil, the area is a net importer—in fact,

the market for a large share of world exports. Most of the oil exported from European countries goes to other countries in the same region.

The record quantities shipped from Denmark and West Germany reflect larger imports for processing and reexporting, since domestic production in both countries changed little from the previous year. Norwegian exports last year were down slightly from 1958. Most of the fish oil included in Norway's share of world exports is fish-liver oil. However, Norway exports around 60,000 tons of hardened marine oils each year. These exports include both fish and whale oil, but are not identified by kind in trade statistics. Thus, Norway's exports of fish oil probably are much larger than indicated.

Peru became an important supplier of fish oil in 1959, and the large volume shipped last year may be exceeded in 1960. Although Peru had facilities to produce large quantities of fish oil prior to 1959, restrictive regulations prevented the industry from any rapid expansion of output. These regulations were relaxed in 1959 and production of fish oil rose to 27,500 tons, an increase of 17,200 tons from 1958. An even larger output is forecast for 1960.

Fish-Oil (Including Liver-Oil) Exports from Specified Countries and Estimated World Total, Averages 1935-39 and 1950-54, Annual 1956-59						
Continent and Country	1/1959	1/1958	1957	1956	Average	
					1950-54	1935-39
..... (1,000 Short Tons)						
North America:						
Canada	14.4	5.7	2.7	9.3	11.6	12.0
United States	72.2	47.0	58.5	71.3	42.2	1.2
Total	86.6	52.7	61.2	80.6	53.8	13.2
Europe:						
Denmark	15.6	12.6	9.8	9.7	6.3	2.5
West Germany	31.6	17.9	14.3	9.3	3.0	2/4.4
Iceland	18.6	27.0	20.9	21.3	19.5	24.5
Netherlands 3/	16.0	13.0	7.1	9.1	14.5	.2
Norway 4/	21.0	22.3	18.6	23.7	30.4	38.0
Portugal	5.6	5.5	4.2	4.7	3.8	.1
United Kingdom	3.7	3.6	3.4	3.8	4.0	6.0
Total	112.1	101.9	78.3	81.6	81.6	75.7
Others:						
Angola	8.8	9.4	13.4	5.7	6.7	.7
Japan	3.6	6.6	3.5	5.0	6.8	35.0
Peru	18.9	1.8	4.8	1.9	.1	—
Union of South Africa	26.2	18.1	11.4	5.4	8.9	2.2
Total	57.5	35.9	33.1	18.0	22.5	37.9
World total 5/	265.0	200.0	180.0	190.0	165.0	135.0

1/ Preliminary.

2/ From Germany.

3/ May include some whale oil.

4/ Does not include sizable quantities of hardened marine oils.

5/ Includes estimates for major exporting countries.

International (Contd.):

A record volume of fish oil was exported from the Union of South Africa in 1959, mainly because of a larger catch of maasbanker and pilchard. To help preserve stocks, an annual quota is imposed on the catch of those fish, and in 1959 the quota was increased to allow fish-meal producers to step up production and compensate for declining world prices. Since fish oil is largely a byproduct of the fish meal industry, oil production also increased. Another factor responsible for the larger output was a planned 25-per-cent reduction in canned pilchard production, which released further quantities of fish for oil and meal production. Exports probably will be large in 1960 because the higher catch limit again will be in effect. (Foreign Crops and Markets, U. S. Department of Agriculture, June 30, 1960.)

FOOD AND AGRICULTURE ORGANIZATION

FISH FARMING STUDIES IN
UGANDA MAY INCREASE YIELD:

The mixed cultivation of tilapia, carp, and Nile perch in fish ponds in Uganda, Africa, has the promise of quadrupling fish production from ponds in that country in a few years, according to an inland fisheries biologist of the Food and Agriculture Organization (FAO), who has just returned from a year's assignment in Uganda. The fisheries biologist said, that the experimental work which he had undertaken during the past year at the Kajansi fish farm, Uganda, showed that the 5,000 ponds in Uganda could support more and other varieties of fish than their current occupants--tilapia.

"Uganda now produces roughly 500 metric tons of fish from her ponds each year," said the biologist. "With a mixed fish population, improved management, the right gear, and fertilization, the yield from the ponds might reach 2,000 tons yearly in 4 or 5 years."

Fish farming began in Uganda in 1953, when the government found that, although Uganda had many lakes, the lack of transportation and processing of fish in the hot African country tended to keep fish out of the diet of Uganda people. Fish could not be found for sale 25 miles north of Lake Victoria--a lake with an area of 26,928 square miles and the world's second largest body of fresh water.

Since fish, a relatively cheap source of animal protein, could not be brought to the people, the Government decided to bring people to the fish, by means of ponds. Tilapia, a small, rapidly multiplying and hardy fish was selected, the ponds were built and then stocked with three varieties of tilapia--Tilapia zillii, T. nilotica, and T. leucosticta.

Farming the fish ponds developed rapidly in Uganda but, as the program went on, it became necessary to obtain more information on scientific fish production and its allied physical and biological research. At the request of the Ugandan Government, the FAO's Fisheries Division supplied technical aid. The FAO biologist began his work at the Kajansi experimental fish farm, aided by British and African fishery officers. A building was outfitted as a laboratory. There, the biologist began to do chemical analyses of the composition of pond water. Once he knew the ingredients of the water, including the amount of algae it contained, he could predict how much fish could be supported under given conditions. In all, he analyzed about 2,000 samples of water.

He then ran through some 500 samples of water containing plankton, to see how much food for the fish was available. Next was analyzing the stomach contents of 300 fish to find out the relation between the food available for the fish, the food eaten, and the food actually digested.

Then came the question of optimum density in a pond--just how many fish the pond could support. Eleven of the fish farm's 30 ponds, ranging in size from $\frac{1}{100}$ of a hectare to two hectares (about $\frac{1}{40}$ to 4.94 acres), were set aside and stocked with the three species of tilapia, and with carp and Nile perch fry of various sizes.

The biologist then turned his attention to the three species of tilapia already inhabiting the ponds. Tilapia nilotica and Tilapia leucosticta live on the ponds' natural production of small aquatic organisms. On the other hand, Tilapia zillii needs to be fed artificially on foods such as elephant grass, sweet potatoes, etc., in addition to the natural resources of the pond.

If the African forgets to feed his fish, then why bother with Tilapia zillii when Tilapia nilotica and Tilapia leucosticta can feed themselves?

"Tilapia nilotica and Tilapia leucosticta now yield only 300 kilos (661 pounds) of fish per hectare (2.471 acres) a year, just using the ponds' natural resources," said the biologist. "However, by feeding these fish, the production could be boosted to 2,000 kilos (4,409 pounds) of fish per hectare per year. Under experimental conditions in small ponds, the production of fish may be extremely high.

International (Contd.):

For example, a maximum of 3,500 kilos (7,716 pounds) of fish per hectare per year has been produced in one small pond. However, such high production can in no way be expected by the average fish farmer of today."

Why were carp and Nile perch selected to be put into the ponds?

"The average carp attains a weight of 1,500 grams (3.3 pounds) in the first year," the biologist stated. "The idea of mixing in carp with the tilapia was first broached in Uganda in 1958, when fingerlings were brought to the fish farm from Israel. Some of these carp now weigh 4,500 grams (9.9 pounds)."

The predatory Nile perch was introduced to the ponds' population of carp and tilapia to keep down the number of small tilapia. The Nile perch, which is also excellent eating, averages about 50 kilos (110 pounds) in lakes when fully grown and has reached a record weight of 175 kilos (386 pounds) in Lake Albert. This gives the ponds a mixed population of the quickly-multiplying tilapia, the rapidly-growing carp, and the Nile perch as a control.

INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS

MORE INFORMATION ON HAMBURG MEETING:

The International Association of Fish Meal Manufacturers met in Hamburg during the second week of June 1960, to discuss future cooperation on scientific research. Participants included delegates from the United Kingdom, West Germany, Norway, South Africa, Spain, Iceland, Portuguese Angola, France, and Belgium. Holland, which is not yet a member, sent an observer. Also an observer from the Food and Agriculture Organization (FAO) and the Federal Research Institute for Fishery in Hamburg took part in the meeting. This meeting established a Scientific Subcommittee to work out chemical and physical examination methods with the view in mind of making it possible to eliminate fish meal of poor quality. Efforts shall be made to have included uniform quality requirements for fish meal in the feed legislation of the member countries.

The delegate of FAO read a paper suggesting a plan of organization to carry out a study of the present and the prospective future trends on the international fish meal

markets. The study shall also deal with the future importance of fish meal in animal feeding and in human consumption. FAO solicited the support of the International Association for this work. The participants welcomed the plans of FAO and pointed out that in the long run the carrying out of these plans could be of great benefit.

The Executive Committee discussed organizational problems. The submitted draft statutes of the Association were approved by the members.

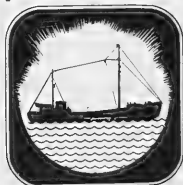
The first regular annual meeting of the International Association was expected to take place in Paris by the end of September this year.

Three United States companies have applied for membership to the Association. (United States Embassy, Bonn, August 6, 1960.)
Note: Also see Commercial Fisheries Review, September 1960, p. 42.

INTERNATIONAL COMMISSION FOR NORTHWEST ATLANTIC FISHERIES

PROGRESS ON STUDIES OF EFFECT OF NET MESH SIZES ON FISH STOCKS:

The International Commission for Northwest Atlantic Fisheries reports considerable progress on a study of the immediate and long-term effects that otter-trawl mesh sizes have on various stocks of fish in the northwest Atlantic.



The progress of the study was reported at the 10th annual meeting of the Commission which was held in early June 1960, in Bergen, Norway. Representing the United States as Commissioners at the Bergen meeting were Thomas G. Fulham of Boston, Mass., and Arnie J. Suomela, Commissioner of the U. S. Fish and Wildlife Service. Suomela is the present chairman of the Commission.

The Commission is composed of members from 12 nations whose fishermen operate off New England, Nova Scotia, Labrador, the west coast of Greenland, and in the Gulf of St. Lawrence. It is primarily concerned with groundfish including cod, haddock, hake, halibut, flounders, whiting, and ocean perch. Member nations are Canada, Denmark, France, Iceland, Italy, Norway, Portugal, Russia, Spain, the United Kingdom, West

International (Contd.):

Germany, and the United States. Delegates from Poland were present as observers at the Bergen meeting.

The mesh-size study was decided on at the ninth annual meeting of the Commission in Montreal, Canada, June 1959. Mesh-size regulations for a part of the area with which the Commission is concerned have been in effect for several years, but the present study is more directed toward determining the effects of various mesh sizes if applied to the entire area, or to all of the north Atlantic fishing grounds. The objective of the study is to see if one mesh size can be applied to all fishing activities in that area.

The technical work of the Commission is done by the fishery biological research units of the member nations. Recommendations for conservation measures, such as mesh-size limitations, when adopted by the Commission are passed on to the member nations. It is the responsibility of each member nation to effect the necessary measures for the guidance of its own fishermen.

The next annual meeting of the Commission will be held in Washington, D. C., in June 1961.

NORDIC FISHERIES CONFERENCE

CONFERENCE MET IN
MID-AUGUST 1960:

Representatives of the Scandinavian fishery organizations and Ministers of Fisheries met in Karlskrona, Sweden, August 16-18, 1960, to discuss current problems. Denmark was represented by a 35-man delegation, including members from the Faroe Islands.

All the delegations--from Norway, Sweden, Iceland, Finland, and Denmark--were led by their respective Ministers of Fisheries, who, following the Karlskrona session, held a separate meeting at Kristianstad.

Among the topics discussed at the Karlskrona meeting were fish protection, effects of radioactivity on life in the sea, and marketing problems posed by development of the European Economic Community and the European Free Trade Association. In addition, the Ministers discussed fishery problems connected with the territorial waters issue.

(United States Embassy, Copenhagen, August 15, 1960.)



Angola

FISHING INDUSTRY FACES CRISIS
DUE TO LOW FISH MEAL PRICES:

The crisis in the Angolan fishing industry is becoming more and more serious and is having grave effects on the economies of the fishing centers. Mocamedes is particularly hard hit because most of the industry, commerce, and agriculture of that area is related directly or indirectly to fishing. Representatives and members of the various business associations in Mocamedes met there on July 21, 1960, to discuss the depression in the industry. The associations passed a motion in the form of a letter which was presented to the District Governor, who was to deliver it to the Governor-General of Angola.

The letter points out that the present crisis has lasted almost two years. The drop in the quantity of the fish catch, the inefficient organization of the industry, the total paralysis of sales, and the catastrophic decline in fishmeal prices threaten the industry with a complete breakdown and endanger the related sectors of the district's economy. While financial and technical assistance will be needed from the Government to solve the long-term problems, the associations declare, it is first necessary to attack the short-term problem--that of preserving what remains of the fishing industry. The assistance given until now by the Government--suspending taxes, cutting export duties, and reducing the price of fuel to the industry--has been helpful but it has not been sufficient to solve the difficulties.

The letter states that 22,000 metric tons of fish meal (43 percent of the amount of fish meal exported by all of Angola in 1959) are stocked at Mocamedes. Exportation has been held back because of the low prices on the international market. Also, the Bank of Angola holds part of these stocks as collateral for loans, the collateral being based on fish-meal prices above the present market prices. The associations declare that it is a primary necessity to export these stocks at least at a price which covers the cost of production.

The motion passed by the meeting also states that the fishing industry owes its fish-

Angola (Contd.):

ermen about 12,000 contos (US\$419,520) in back wages. These should be paid immediately, and the payment of wages coming due in the future should be assured until such time as the industry can be reorganized.

To avoid the complete collapse of the Mocamedes fishing industry and the breakdown of the economy in that district, the motion states that a loan from the Government of 50,000 contos (\$1,748,000) is indispensable. A committee would oversee the expenditure of the money. The Government would be repaid at a convenient time in the future by the levy of a 1- or 1½-percent tax on goods passing through the port of Mocamedes.

In his reply to a telegram from the associations, the Governor-General reviewed actions taken by the Government to aid and solve the problems of the fishing industry, including a recently-allowed subsidy of US\$10 a metric ton on fish meal exported after July 1, 1960, the United States Consul in Luanda reported on August 2, 1960.



Argentina

FISH MEAL AND OIL INDUSTRY:

There are four reduction plants in Argentina--two in Mar del Plata, one in Bahia Bustamante, and a new one in Puerto Deseado. While the capacity of the two plants in Mar del Plata is unknown, their combined annual production has averaged 3,000 metric tons of fish meal during recent years. The plant in Bahia Bustamante (not in operation at the present time) is known to have a very small capacity. The Puerto Deseado plant (due to open in August 1960) expects to have a capacity of 6,000 tons of fish meal annually.

Production of fish meal in Argentina amounted to 3,000 metric tons in 1959. No fish oil was produced in commercial quantities and no exports of fish meal or fish oil were made in 1959.

Fish used for reduction in Argentina are not differentiated by species; reduction plants pay one peso a kilogram (about US\$11 a short ton) for hake and sardines, which are the principal species used for reduction. However, the two Mar del Plata plants rarely

purchase whole fish, but use cannery waste for which they pay 30 centavos a kilogram (about \$3.30 a short ton). Officials of the Puerto Deseado plant estimate that their production costs for fish meal will be \$80 a metric ton (about \$72.58 a short ton).



There has been no recent development or plans for the development of the reduction industry in Argentina other than the new Puerto Deseado plant. Neither the Argentine federal nor provincial governments offer any form of aid to the reduction industry, according to a July 25, 1960, dispatch from the United States Embassy in Buenos Aires.



Australia

THREE-YEAR SHRIMP SURVEY ENDS:

Australian survey of shrimp resources off the eastern Australian coast, which began in July 1957, ended according to plan in June 1960. The survey was carried out by the Fisheries Division, Department of Primary Industry, with the 85-foot chartered vessel *Challenge*, and was financed by the Fisheries Development Trust Account.

The survey got off to a good start with the discovery, in July 1957, of a new shrimp ground near Fraser or Great Sandy Island, in southern Queensland, covering some 750 square miles and extending from Double Point Light to Indian Head. King prawns were predominant, with tiger prawns the second species.

In November 1959, another new ground was found, extending for at least 15 miles from NE. to NW. of Cape Moreton, also in southern Queensland. This also was a king prawn ground.

The best catches elsewhere were taken in May 1959, off Lakes Entrance, in eastern Victoria, where 100 pounds of king prawns were obtained in 8-9 fathoms. Trawling in deep water was discouraging.

Australia (Contd.):

During the three years of the survey the Challenge covered over 2,000 miles along the coast from Princess Charlotte Bay in northern Queensland to Wilson's Promontory in Victoria. Up to May 2, 1960, a total of 1,942 drags had been carried out, the majority in 20-100 fathoms but some over the "Shelf" in up to 160 fathoms.

The work on the Queensland coast has shown that banana prawns may be found from Indian Head northwards. This is the species favored by the United States market.

Westerly weather towards the end of April 1960 made it necessary for the Challenge, which was then on the New South Wales south coast, to work inshore waters.

Areas searched included Cape St. George to Beecroft Head in 6-30 fathoms, Crookhaven Bight, northern end of Shoalhaven Bight, Black Point to Bass Point (from Kiama), Bass Point to Big Island, Windang Island, NE. of Bellambi Reef. On April 25, the vessel was at Wollongong.

A few school prawns were taken at the northern entrance to the Shoalhaven River and in the vicinity of Windang Island where seven juvenile king prawns were also obtained.

During the last week of April and into May, the Challenge worked inshore waters in the vicinity of Lake Illawarra, Shell Harbor, and Bate Bay, and trawlable ground in 50-120 fathoms from Bass Point to Botany Bay and from South Head to Broken Bay.

Following a report by Dr. Racek of Sydney University that royal red prawns had been taken in quantity in New Zealand in 80 fathoms, it was decided to trawl to 120 fathoms but no results were obtained. Working over the edge of the "Shelf" east of Sydney to Broken Bay, one king prawn was obtained in a night drag in 120 fathoms, but eight day drags yielded nothing.

During the last three weeks of the survey, in May 1960, the Challenge worked northwards from Sydney without obtaining any commercially-significant results. (Australian Fisheries Newsletter, June 1960.)



British North Borneo

JAPANESE REVIVING FISHING INDUSTRY:

The first consignment of frozen fish from North Borneo to the United States was shipped in June by a North Borneo trading company, according to British North Borneo newspapers. A Japanese firm has revived the pre-war Japanese fishing operations on Si Amil Island off the Semporna Peninsula in the Celebes Sea area of North Borneo. Pending reconstruction of the canning and processing factory on the Island, a factoryship, the Ginyo Maru, which has cold-storage facilities, has anchored off the Island for processing operations. Reportedly, 300 Japanese fishermen and technicians are operating 30- to 40-ton trawlers in deep-sea areas in the surrounding waters.



A 1959 Japanese economic mission to British North Borneo seems to have been successful in reviving the fishing industry, states a July 7, 1960, dispatch from the United States Consul in Singapore.



Canada

TRAWLERS TO BE PERMITTED TO FISH IN 3-12 MILE ZONE OFF EAST COAST:

Canadian newspapers announced on August 7, 1960, that Canada's Fisheries Act will be amended at the next session of Parliament to permit large otter trawlers to fish in the 3-12 mile zone off Canada's Maritime Provinces on the east coast. The vessels now by law confine their fishing in the area outside the 12-mile limit, while foreign fishing vessels are permitted to fish off Canada's east coast up to the 3-mile limit. The amendment would give large Canadian fishing vessels equal fishing rights with foreign fishing fleets off the coasts of Prince Edward Island, Nova Scotia, and New Brunswick. The present law does not apply to the coast of Newfoundland.

The Canadian Minister of Fisheries in reply to a question raised in Parliament on August 9 as to whether the Government was contemplating a change in present Canadian law which prohibits the larger Canadian trawlers from fishing within 12 miles of the coast of the Maritime Provinces noted that the Government was concerned with the matter and "is studying possible means of remedying this anomalous situation." (United States Embassy report from Ottawa, August 9, 1960.)

Canada (Contd.):

LAKE ERIE SMELT TRAWL MAY BE ADAPTABLE TO SARDINE FISHERY:

Catches of up to 5,000 pounds of smelt in 10-minute tows have been achieved with an improved combination bottom, midwater, and surface trawl designed by the Industrial Development Service, Department of Fisheries of Canada, and operated in Lake Erie. This development led to the idea of modifying this trawl for the catching of sardines in the Bay of Fundy. Stretched-mesh sizes ranged from 4 inches in the wings and fore section of the body, 3 inches in the second section, and 2 inches in the third section of the body, then one inch in the tapered lengthening piece and $\frac{1}{8}$ inch in the cod end. The net has a square section and the dimensions of the mouth are 30 feet square. The first trials with the sardine trawl were carried out by a 50-foot dragger in the Bay of Fundy near Beaver Harbor, New Brunswick.

The results of the preliminary trials indicate that the trawl has a potential application to this particular fishery. The dragger's captain feels confident that a winter trawling operation on scattered schools of herring when using this gear will create a new source of income for draggers which, otherwise, would be idle.

* * * * *

MECHANICAL DIGGER DEVELOPED FOR SOFT CLAMS:

Considerable success has already been achieved by the Fisheries Research Board of Canada in the development of a mechanical shellfish harvester to replace manual digging operations which are both inefficient and destructive to the small clams which the fishermen leave behind.

It is reasonable to expect that the use of more efficient and less destructive harvesting tools will bring about a long-term increase in clam production.

In order to provide a manually-operated machine within the means of the average fisherman which will operate in places that are inaccessible to the mechanical harvester, a new piece of equipment is being developed. The design and development of the machine are being undertaken by the Fisheries Research Board at its St. Andrews Biological Station in cooperation with the Department of Fisheries' Industrial Development Service.

Cuba

CLOSED SEASONS FOR CERTAIN SHELLFISH REVISED:

By a resolution dated July 11, 1960 (published in the Official Gazette, July 14, 1960), the Cuban National Fishery Institute decreed that the closed season on tortoise and turtle species previously ordered to be in effect from June 15 through August 30, 1960, would be lifted on August 10, 1960, in consideration of the precarious economic situation of the fishermen. A closed season on river shrimp or prawns announced in the Official Gazette of June 30, 1960, is effective from June 15 to August 30, 1960, and on the same date the closed season on spiny lobster (Panulirus argus langosta) was lifted effective June 15, 1960.

In another resolution published in the Official Gazette of June 30, 1960, the Institute ordered a closed season from July through October 15, 1960, on moro crabs (Menippe mercenaria). (U. S. Embassy, Habana, July 25, 1960)



Denmark

FISHERIES TRENDS, SECOND QUARTER, 1960:

Although statistics on the landings of fish and shellfish in Denmark for the second quarter of 1960, are not complete, it is estimated that landings improved somewhat over the first quarter, but still lagged behind the record set in 1959. Decreased landings of fish for reduction into fish meal and oil were responsible for the drop this year as compared with last year. Low ex-vessel prices for fish for reduction have forced the Danish vessels to turn to fishing for edible fish. A few of the modern steel vessels, which were designed for industrial fishing, have been leased to foreign countries.



Beached Danish fishing boats.

Denmark (Contd.):

The sharp drop in world fish meal prices is attributed partly to Peruvian competition, and the low price for solubles to the poor market in the United States which is Denmark's principal customer for that product.

During April-June 1960, attempts by rainbow trout exporters to stabilize the market were unsuccessful. The Association of Trout Producers disbanded after failing to reach a workable agreement on price controls.

In Greenland a new shrimp-canning factory was opened at Christianshaab in mid-June. This new factory will double Greenland's capacity for packing canned shrimp. Shrimp-peeling machines from the United States are being used in the new cannery. (United States Embassy, Copenhagen, report of July 12, 1960.)

* * * * *

EXPANSION OF GREENLAND'S FISHERIES UNDER CONSIDERATION:

A project for joint Danish-Faroese-Greenlander exploitation of the Greenland fishing banks is currently under consideration, according to a July 31, 1960, press statement by the Director of Royal Danish Greenland Trade. Should the plans materialize, Godthaab would become the base for a fleet of larger fishing boats and trawlers, with the catch to be landed and processed at that port. Only through the development of greater processing facilities, said the Director, could the Greenlanders themselves benefit economically from any extension of their territorial waters, since they lack vessels large enough to exploit the farther reaches of those waters. And inasmuch as the cod, Greenland's principal commercial fish, appears periodically to forsake the coastal waters for the banks, it is feared that without vessels to follow any such move the fishing industry, so vital to Greenland's economy, would be subject to sudden collapse.

The Director estimated that Greenlanders take less than 10 percent of the current catch in Greenland waters, and stated that at present not a single Danish-based fishing vessel is operating there. Faroese fishermen appear to be fairly active there, however. Fragmentary figures cited in the press statement indicate that this season the Faroese and Greenlanders have already taken up-

wards of 2,500 metric tons of fish in the Sukkertoppen and Egedesminde districts, currently the best Greenland waters for cod.

When the Minister for Greenland recently visited Greenland, he promised that the improvement of fishing facilities would receive top priority in plans for Greenland's economic development, states an August 3, 1960, dispatch from the United States Embassy in Copenhagen.



El Salvador

SHRIMP FISHERY TRENDS, JULY 1960:

Shrimp is El Salvador's third major export (after coffee and cotton), and the bulk of the catch is flown frozen to United States markets.

Despite intermittent talk of possible conservation measures, a new firm with substantial capital is planning to enter the fishing industry and will probably lead to further development of fishery resources. In another development, the major firm now fishing in El Salvadoran waters is building its own pier and handling facilities at La Union on the Gulf of Fonseca (U. S. Embassy in San Salvador, July 15, 1960.)



Fiji Islands

TUNA CANNERY WITH JAPANESE INTERESTS:

An important planter on Ovalau, Fiji Islands, has reportedly with Fiji Government approval entered into an agreement with Japanese interests to establish a tuna cannery at Lovuka and utilizing the existing wharf and sheds. In this connection, a partner in a Japanese firm recently visited Fiji. It is believed that Japanese personnel would be brought in to operate the cannery and that the fish (mostly tuna) would be provided by one or more of the Japanese fishing companies now operating in South Pacific waters. (United States Consulate, Suva, July 28, 1960.)



France

FISH MEAL AND OIL INDUSTRY AND MARKETS:

French imports of fish meal from the United States and other General Agreement on Tariffs and Trade (GATT) countries are theoretically subject to a 15-percent duty; however, in practice, the duty since 1955 has been 10 percent. The theoretical duty could be reverted to at any time. The duty for fish meal of Common Market origin (German, Italian, or Benalux) was reduced to 8 percent on July 1, 1960, and is due to disappear gradually. From November 5, 1959, to February 29, 1960, the duty on fish meal regardless of its origin was completely suspended. There are no quantitative restrictions on the import of fish meal.

Table 1 - French Imports of Fish Meal

Country of Origin	Quantity Imported		Average Import Price	
	1st Half 1960	1959	1st half 1960	1959
	.. (Metric Tons) ..		(US\$ Per Metric Ton/)	
Belgium-Luxembourg	90	-	118	-
Chile	792	-	112	-
Denmark	-	534	-	209
Iceland	-	1,384	-	193
Japan	-	565	-	174
Morocco	1,279	9,653	128	150
Norway	4,488	16,971	137	179
Peru	7,938	1,871	127	147
Portuguese territories in Africa	148	1,442	101	160
St-Pierre & Miquelon	191	-	132	-
Tunisia	83	-	82	-
Union of South Africa	302	2,741	170	167
United Kingdom	20	3,461	152	189
Others	251	1,240	-	-
Total	15,582	39,862		

1/Values converted at rate of US\$1.00 equals 4.93 new francs.

Halibut oils coming from the United States and other GATT countries are theoretically subject to a 30-percent duty; however, this duty has been completely suspended since 1955. Halibut oils of Common Market origin are exempt from duty. There are no quantitative restrictions on the import of halibut oils.

Oils and fats of other fish coming from the United States and other GATT countries are theoretically subject to an 18-percent duty, but this duty has also been suspended since 1955. Imports from Common Market countries are exempt from duty. Crude herring oils, alimentary fluid oils, and refined oils are still subject to quota restrictions, but other fish oils and fats are free of quantitative controls.

French production of fish meal increased from 6,000 metric tons in 1952, to 8,500 tons in 1955, to 14,000 in 1958, and to 18,000 in 1959. This increase is primarily attributable to a larger supply of raw materials, particularly waste from canning, filleting, etc. Nevertheless, the supply of waste production is limited (less than 20 percent of France's fish production is canned and less than 10 percent is filleted), and further expansion of fish-meal production will depend to a large extent on better methods of collecting and preserving the waste, the level of production activity in the canning and filleting industry, and the possibility of using more whole fish.

While the fish meal produced in France is of an acceptable grade, the principal raw material (waste products) is poor in quality and low in protein content compared with whole

fish. The industry has been trying to improve the quality of its fish meal by using a greater quantity of whole fish, and efforts were made in recent years to persuade fishermen to fish for the reduction industry. These efforts resulted in an increase in the amount of whole fish supplied to the industry, but the total quantity remained small compared with the amount of waste products used. Damaged and unsold fish are also used in the production of meal.

The price of whole fish, of course, is much higher than that of fish waste—2.0 U.S. cents to 3.2 cents per kilo (US\$18-29 a short ton) for whole fish as compared with 1 cent a kilo for waste (\$9 a short ton), and the use of whole fish depends on the price that can be charged for fish meal. The trend toward greater use of whole fish came to an abrupt end in November 1959, when the suspension of the fish-meal duty lowered the price of imported fish meal. In spite of the restoration of the duty in February 1960, competition from low-priced Peruvian fish meal has prevented the industry from renewing its effort to use more whole fish.

Fish oil, a byproduct of the fish-meal industry, is produced in very limited quantities in France, and some of the fish-meal plants discard the oils derived from the production of fish meal. Fish-oil production in 1956 was estimated to be 2,000 to 2,500 metric tons and may have risen to 3,000 tons in 1959.

Table 2 - French Imports of Fish Oils

Type and Country of Origin	Quantity Imported	
	1st Half 1960*	1959
	.....(Metric Tons).....	
Halibut:		
Norway	1	40
Other:		
Belgium-Luxembourg	21	124
Japan	92	164
Madagascar	-	87
Morocco	1,786	3,259
Norway	291	734
Peru	-	325
Portugal	186	543
Spain	90	30
United States	23	51
Viet Nam	-	71
Other	10	40
Total imports	2,500	5,468

Note: The French customs nomenclature does not distinguish between fish-body oil and other fish oils. In addition to the two categories of fish oils, the customs statistics also show imports of "oils from sea mammals" and "cod-liver oil," which are not included.

Fish meal and fish oils are produced in France by about 20 plants located on the North and Atlantic coasts and in the Paris area. None are situated along the Mediterranean coast. A trend toward concentration has been taking place in recent years, particularly in the port areas where the supply of raw materials can generally support a single plant and no more. However, most French fishery reduction plants are overequipped, and can cope with an irregular supply of raw materials; it is believed that total capacity of the industry is several times actual production.

French consumption of fish meal (about 2.2 pounds per capita) is relatively low compared with such countries as Great Britain (11.0 lbs.), the Netherlands (22.0 lbs.), and Denmark (40.0 lbs.); however, consumption is increasing and it is expected to continue to increase because of the growing demand of cattle breeders, dairy and poultry farmers.

While the industry is probably capable of satisfying the domestic demand for fish meal and fish oil, it is unlikely that production will increase significantly in the foreseeable future because of the lack of further supplies of low-

France (Contd.):

cost raw materials. Imports can therefore be expected to continue and purchases will be made where the most favorable price can be obtained. (United States Embassy, Paris, August 3, 1960.)



French West Indies

UNITED STATES TUNA CANNER INTERESTED IN BUILDING COLD-STORAGE PLANT IN MARTINIQUE:

The Prefet of Martinique in August 1960, had a visit from a group of United States and French industrialists interested in building a cold-storage plant for fish in Martinique, French West Indies. The Americans represented a large California tuna canner and the French represented the French subsidiary of the California firm. The visitors explained that they wish to ship to the United States French-caught tuna coming from off the west coast of Africa. However, in order to avoid the reportedly high costs which would result from shipments in French vessels, they plan to transship in United States vessels. For this, cold-storage facilities at the point of transshipment are necessary. The Prefet said that other United States fish-packing interests had similar arrangements at Trinidad and Haiti.

The Prefet expressed his complete support of the proposal and said that he has requested 100 million old francs (US\$203,000) from the French Government to enable the Department of Martinique to put into usable condition a pier and to dredge the approaches in the area where the industrialists plan to build the cold-storage plant, at the eastern edge of the Fort-de-France port area. Next year, he said, as construction on the cold-storage plant gets under way, he will request an additional sum of from 500 million to 700 million old francs (\$1.0 to \$1.4 million) in order for the Department to build much better dock facilities.

He added that the industrialists were particularly interested in plans now under way for the construction of a new pineapple packing plant in the area where they intend to put up the cold-storage plant. It seems as if it recently has been discovered that fish meal used in animal or poultry feeding is enhanced if mixed with the waste from

pineapple packing. (United States Consulate, Martinique, August 13, 1960.)



German Federal Republic

TECHNOLOGIST DEVELOPS NEW METHOD FOR PRESERVING FISH AT SEA:

A technologist of Hamburg, West Germany, has announced the development of a new method of preserving fish aboard vessels. The method would entail the storage of freshly-caught fish in airtight tanks. The air would then be evacuated from the tanks and temperatures reduced quickly to about 1° C. below the freezing point in a vacuum. This process would not only remove gases from the body of the fish but also, through the evaporation of moisture, freeze the surface of the fish to prevent it from drying out and to keep it fresh. In the absence of oxygen, the development of aerobic bacteria would be virtually eliminated.

The cost of a vacuum plant for installation aboard West German trawlers is estimated at about DM600,000 (about US\$142,900). A trawler thus equipped would save present expenses for ice and possibly improve the value of its catch by as much as 10 percent.

The Federal Fisheries Research Institute of Hamburg has tested the new preservation method in a shore installation with very good results. The Institute recommends the experimental installation of such a vacuum plant aboard a commercial trawler or aboard a West German fisheries research vessel. (United States Consul in Bremen, August 3, 1960.)



Greece

FREEZER-TYPE TRAWLERS REPORT GOOD CATCHES IN JUNE:

The four freezer-type trawlers fishing off the coast of Northwest Africa (Mauretania), in June 1960, caught and froze 1,300 metric tons of fish. The freezer-trawlers were expected to exceed this amount in July.

The new freezer-trawler *Zephyros II* returned to Piraeus from the Northwest African fishing grounds about June 1 with 352 tons of frozen fish. (*Alieia*, July 1960.)

Greece (Contd.):

SARDINE AND ANCHOVY
LANDINGS GOOD IN JUNE:

During June, landings of anchovies and sardines in Greece were very good, according to the July 1960 Greek fisheries periodical Alieia. The fish canneries and salting plants were busy processing the catches.

As a result of the plentiful supplies, ex-vessel prices dropped to 13 drachmas per kilo (about 5.9 U. S. cents a pound) for large anchovies (about 6 inches).



Greenland

SHRIMP INDUSTRY EXPANDS:

Shrimp production in Greenland is expected to double this year with the operation of a new shrimp-processing plant in Christianshaab as part of a large investment.

Later a shrimp plant will be built in Jakobshavn, and there is a proposal to give a private Danish company permission to build a shrimp plant in Godhavn on Disko Island. Fishermen receive 50 to 80 øre per kilo (3.3 to 5.3 U. S. cents a pound) for heads-on shrimp. The shrimp grounds in Disko Fjord are considered to be the world's richest by biologists. They are considered to be inexhaustible because they are steadily replenished by the addition of young shrimp from the ocean. (Fiskeritidende, July 13, 1960.)



Guatemala

JAPANESE COMPANY GRANTED PERMIT
TO FISH OFF COASTS OF GUATEMALA:

A Japanese fishing company has been granted a commercial fishing permit for both coasts of Guatemala up to the 12-mile limit for a period of 10 years. The permit includes the following provisions: (1) Fishing operations may be subcontracted with approval of the Ministry of Agriculture. (2) Foreign fishing boats may operate in Guatemalan waters for 6 months before having to secure Guatemalan registration. (3) Refrigerator boats of the company must be Guatemalan-registered. (4) The company must sell to the Guatemalan Government all that the latter may require at prices fixed by the

Ministry of Agriculture (but in no case at less than production costs). The company must start operations by August 5, 1961. The company may rent national land for 5 years for warehouses, housing, refrigerator space, etc., and its installations and boats may enjoy concessions under the Industrial Development Law. (United States Embassy, Guatemala, August 11, 1960.)



Hong Kong

GOVERNMENT AIDS FISHING INDUSTRY:

Typhoon "Mary" which hit Hong Kong in June, damaged 123 fishing craft beyond recovery or repair and washed out the oyster beds north of Castle Peak. Rehabilitation loans and grants were quickly made available to the fishermen affected for the purchase of new boats and gear, and in general, fishing operations were soon resumed. Fresh marine fish landings declined successively during the April-June 1960 quarter from March levels.

The Fisheries Development Loan Fund Advisory Committee held its first meeting in April to establish the principles under which fishermen will be enabled to buy through the HK\$2-million (about US\$350,000) fund Diesel engines, navigational aids, motor winches, and other modern fishing gear. (United States Consulate, Hong Kong, July 18, 1960.)



Iceland

FISHERIES TRENDS, MID-JULY 1960:

The Icelandic north coast herring season by July 9, 1960, had far exceeded even the high levels of the 1959 season. The over-all quality of the herring catch has been comparable to last year's. As of July 9, 1960, 48,033 metric tons had been delivered for processing as compared to 21,235 tons for the same period last year. Most of this year's catch (43,861 tons) went to the reduction plants and most of the balance went for salting, except 83 tons exported directly to Denmark on ice. The lean herring was still being processed for meal and oil despite the decline of world market prices for those products, and large stocks stored in Iceland.

Iceland (Contd.):

The controversial new small trawler flounder fishing arrangements within Iceland's 12-mile fishing limits now permit small vessels to bring this catch in to the Westman Islands.



Westman Island, Iceland, fishing harbor, showing vessels at dock and processing plant.

Various plans are being tried in selling this product, including flounder shipments on ice directly to Denmark. This type of landing was protested on July 12 by Danish fishermen. One enterprising Icelandic exporter is shipping the flounder by air in plastic bags to Amsterdam for the Dutch market. The planes also carry other fishery products.

Municipal authorities on the Westman Islands insist that the shipments not take place unless there can be a guarantee of high quality. Flounder shipments, it is understood, must arrive at the market within 36 hours after being caught. Shipment by air in aluminum boxes has been advocated.

Icelandic whaling operations, which are based on a single shore plant, have been progressing quite satisfactorily this season. By July 7, 153 whales had been landed, compared with 128 for the same period of 1959. (United States Embassy, Reykjavik, July 15, 1960.)

HERRING FISHERY TRENDS, JULY 1960:

During the latter half of July 1960, the Icelandic north coast herring landings began to lag behind the very good landings made during the same period of 1959. As of July 24, about 68,220 metric tons of herring had been landed compared with 77,522 tons by the same date in 1959. A far smaller amount was of good enough quality to deliver for salting--10,090 metric tons as compared with 16,933 metric tons by July 24 last year. Most of the remainder was used for meal and oil.



India

NEW FIVE-YEAR PLAN PROVIDES FOR RAPID EXPANSION OF FISHERIES:

Landings of fishery products in India, estimated at 1.0 million metric tons at the end of the First Plan, is expected to increase to 1.4 million tons by 1960/61 and to 1.8 million tons by 1965/66, according to the Third Plan Draft Outline. Nearly two-thirds of the increased production during the Third Plan is expected from marine fisheries.



A view of the quay-side, Cochin, India, where the fish catch is auctioned. Dugouts shown are traditional small fishing vessels of the region.

The mechanization of fishing craft and development of designs for fishing craft suitable for different sections of the coast were taken up in the First Plan. By the end of First

India (Contd.):

Plan, about 650 boats had been mechanized, mostly in Bombay. Another 850 boats have been mechanized since the beginning of the Second Plan in Bombay, Kerala, Mysore, Madras, Andhra Pradesh, and Orissa. Training in the use and maintenance of mechanized boats is being provided at 9 centers in different states.

During the Third Plan, the program of mechanization of fishing craft will be expanded to effect mechanization of about 4,000 boats. Special emphasis is to be given to the exploration of new fishing grounds and to the exploitation of marine resources through cooperatives as well as through private fishing companies.

Development of fishing harbors and berthing facilities will also be taken up. The provision of refrigerated rail cars and insulated trucks for the transport of fish over long distances has been included in the program. As regards inland fisheries, about 300,000 acres of inland waters have been surveyed, about 13,000 acres have been reclaimed, and over 600,000 acres have been stocked through 1958/59. A training course in inland fisheries and management has also been organized. The program for the Third Plan will include survey of about 300,000 acres, reclamation of 6,500 acres, and stocking of another 200,000 acres, states a July 21, 1960, report of the U. S. Foreign Agricultural Service in New Delhi.



Italy

FISH MEAL AND OIL MARKET:

The domestic production of both fish-meal and fish-body oil in Italy is limited and the annual requirements of those products must be met largely by imports. The annual requirements for fish meal are estimated to be 13,500-14,500 metric tons and for fish-body oil about 7,500 tons. Imports of fish meal in 1959 amounted to 13,258 tons valued at US\$2,248,000. Of this amount 6,321 tons (47.7 percent) was imported from Angola. Other suppliers were Norway, Denmark, Portugal, and to a limited extent, Communist China. Imports of fish-body oil totaled 7,780 tons valued at \$1,599,000 in 1959. Among the principal suppliers were the United States (1,215 tons) and Norway (965 tons).

Prices c.i.f. Italian port for imported fish meal quoted by the National Association of Feed Producers and the Cooperative Organization of the Agricultural Farmers in July of this year were: Angola fish meal, mechanically-dried, 65-percent protein, \$85-87 a metric ton; naturally-dried, 60-65 percent protein, \$82-83 a ton; and Peruvian fish meal, 65-percent protein, \$84 a metric ton.

Average prices for marine oils (all taxes and fees paid) as of early August this year were as follows: whale oil, 165 lire a kilo (about 12.05 U. S. cents a pound); shark-liver oil, 160 lire a kilo (about 11.68 U. S. cents a pound); sardine oil, 135 lire a kilo (about 9.86 U. S. cents a pound); and cod-liver oil, 160-220 lire a kilo (about 11.68-16.07 U. S. cents a pound).

Imports of fish-meal and fish-body oil into Italy are unrestricted. Duties as of June 30, 1960, applied to the c.i.f. value are 8.1 percent ad valorem for fish meal from European Common Market countries and 9 percent for fish meal from other countries. Other charges or taxes include an administrative fee of 0.5 percent on the c.i.f. value and an Italian Government exchange tax of 3.3 percent on the c.i.f. value. These latter charges are also applied to the c.i.f. value of fish oil imports which are otherwise free of duty. (United States Embassy, Rome, July 22, 1960.)

SUBSIDIES FOR FISHING INDUSTRY AS OF JUNE 30, 1959:

Italian legislation passed in 1957 authorizes subsidies for fishermen, fishing cooperatives, and fishing concerns up to 40 percent of the cost of new or improved craft, fishing equipment, works and installations for preserving or processing, and transporting products for coastal fishing operations only. As of June 30, 1959, 460 subsidies were granted totaling 786 million lire (US\$1,267,000) for investments of 2.2 billion lire (US\$3,545,000). Of these, 132 had received actual payment of 176 million lire (US\$284,000) for total investments of 459 million lire (US\$740,000). (United States Embassy, Rome, July 11, 1960.)



Japan

AUGUST PRICE FOR FROZEN YELLOWFIN TUNA EXPORTS TO UNITED STATES LOWER:

The Japanese Export Tuna Freezers' Association held a meeting of its Directors on July 29, 1960, to discuss the basic export price for shipments of frozen yellowfin tuna to the United States for August. This meeting followed a meeting held on July 25, between this association and the Frozen Foods Export Association which ended in disagreement on the August export price. At the July 29 meeting, the producers voted to make an across-the-board cut of \$20 a ton from the US\$260-a-ton base price which had prevailed from April to July. The new base price will be US\$240 f.o.b. Japan for 20-80 pound gilled and gutted clipper-frozen yellowfin tuna.

The meeting also decided to add the port of Willemstad on the Island of Curacao in the Caribbean to the list of approved ports for transshipment of tuna to the United States. One Japanese fishing company had asked for approval of this transshipment port some time ago.

The \$260-a-ton price for yellowfin for the United States market held up strongly during April and May, but thereafter, as the American purse-seiners continued to make good catches of yellowfin, and the United States canned tuna market softened, the price gradually fell. At present, deals at \$235 are considered the usual thing, and for this reason the exporters' association had asked that the price be brought down to \$230. Since the producers have agreed to the price of \$240, it looks as if the exporters will compromise at that figure. (The Suisan Tsushin, July 30, 1960.)

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BASE PRICE FOR TUNA EXPORTS TO ITALY TO BE REEXAMINED:

The Japan Frozen Foods Export Association's agreed price for export of tuna to Italy is at present US\$270 per metric ton c. & f., but it is reported that the actual market has already fallen below \$220. Since the spread from the agreed price is so great, sentiment is rising for doing away with the agreed price or establishing a new agreed price consistent with the actual situation. The Association's committee on Italian exports is expected to produce a decision shortly.

At present there is in Italy about 8,000 metric tons of frozen tuna in storage, of which the packers are holding 3,000 tons and the Japanese 5,000 tons, so that there is no prospect at present of the market's recovering. However, there are prospects for Yugoslavia to resume import licensing in September, and in the autumn all of the boats fishing the Atlantic will switch over to albacore and stop catching yellowfin, so the trading companies are hoping that the situation will recover considerably by the end of the year. (The Suisan Tsushin, July 30, 1960.)

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ITALY BUYS FROZEN TUNA ONLY IN SMALL LOTS:

The attitude of the Italian fish-canning industry on purchases of Japanese frozen tuna is showing a big change since the recent sharp drop in the world tuna market. Up through July 1960, they bought entire vessel trips, but in August there were no such purchases. Italy is reported buying in small lots of 5, 10, or 30 metric tons, or as they need the fish. This is because of the accumulation of frozen tuna stocks in Japanese hands, which makes it possible for the Italian packers to buy whenever they need tuna. This accumulation of stocks and the fact that future market prospects are completely unstable have brought about this situation.

Furthermore, at present quality claims are being filed on 50 to 60 percent of the tuna sold to Italy. Second-grade tuna is not, as in the United States, completely discarded, but is used as raw material for second-grade canned tuna. However, the second-grade product is retailed much cheaper than first-grade tuna, 300 lire as compared with 500 lire (48 U. S. cents as compared with about 80 cents) a can. With the increase in second-grade raw tuna, the price for frozen tuna is tending to drop even lower. The discount in price on fish against which quality claims are made has recently been more than 40 percent. (The Suisan Tsushin, August 8, 1960.)

The Vice-President of the Japanese Tuna Fishery Federation stated recently in the Nippon Suisan Shimbum that all of the salmon and mackerel fishermen who want to get into tuna fishing do not realize the real situation in tuna. They all think tuna fishing is profitable, but the fact is that of the 1,800 tuna operators, half are in business difficulties.

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Japan (Contd.):

CANNERS HAVING TROUBLE MEETING CONTRACTS FOR LIGHTMEAT TUNA IN OIL:

According to a Japanese fisheries periodical, the Japanese fishermen are experiencing the worst skipjack season in 10 years or more, and the packers are short on canned lightmeat tuna contracts for Europe. They had hoped that the July 1960 big-eyed tuna landings would help, but that species is not coming in either. It was estimated that for June and July there would be about 100,000 to 150,000 cases that were contracted for but could not be delivered.

Traders are seeking extensions of contracts, but it is thought penalties will have to be paid on most of the contracts as future production prospects are poor.

With an export price of US\$6.20 to \$6.30 a case f.o.b. for lightmeat tuna in oil, and a domestic price of \$6.11-\$6.39 a case, the market is somewhat above normal, but as the ex-vessel price of skipjack is staying above 70 yen a kilogram (about \$176.00 a short ton), the cannery are losing more than 300 yen (about \$0.83) a case.

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EDITORIAL HIGHLIGHTS CANNED TUNA EXPORT PROBLEMS:

An editorial ("On Solutions to Canned Tuna Export Problems") in the Japanese periodical Suisan Keizai highlights Japanese canned tuna export problems. The editorial points out that it has been decided to cut the price of canned white meat tuna for export to the United States by \$1 a case. There was an earlier cut of \$1 at the end of February 1960, which means that within only one year the price of white meat tuna, which was \$11 a case last summer, has been cut by \$2. This softening of the United States market is reported to reflect the effects of an increase in imports into the United States of third-country merchandise and good tuna catches by the United States tuna fleet. In particular, the invasion of the United States market by third countries was beyond expectations, and it has forced Japanese goods into a stiff competitive struggle. Concerned industry circles appear to consider that by the end of the export year the quantity of third-country goods will be double that of last year.

It has to be admitted, continues the editorial, that this is a depressing development for the Japanese canning industry, which has assiduously cultivated the United States market. The Japanese canned tuna production quota for this year is 2.28 million cases, and with a hold-over of 120,000 cases from last year, this makes a total of 2.4 million cases to be disposed of this year. However, the amount offered for sale as of July 1960, was 1.58 million cases, and a considerable quantity of that is still not contracted for, the amount actually having been disposed of being reported as about 1 million cases. At this time of the year, if things had been going smoothly, 1.7 or 1.8 million cases would have been sold, but the movement of merchandise has been unexpectedly slow and there has been no expansion of sales at all. Consequently, the joint sales company's inventories are just increasing, and appear to have reached about 1 million cases.

The industry is trying to figure out what to do to remedy the situation, according to the editorial. However, in the present buyer's market, with the Japanese industry not in a position to take the initiative in the United States market, there does not seem to be any brilliant solution in sight, and that has led to the \$1 cut in the white meat price in an attempt to step up sales. This has been a real headache for the industry, for this year ex-vessel prices for both albacore and skipjack are unusually high, and the canned tuna price cut is making it more and more a situation of "buy high and sell low." Since the price of skipjack is more than twice that of last year, it has brought packing of light meat in oil to a complete stop. It is calculated that with the ex-vessel price of albacore at 120 to 140 yen per kilogram (approximately US\$302 to \$353 a short ton), \$10 a case is barely breaking even. Consequently the recent price cut means that most of the packers are operating in the red.

There is no possibility, as there was last year, of covering the loss with skipjack packing, says the editorial. The tuna canning industry, which has been carefully fostered since the mid-1920's, now has problems. Of course, the industry should get together, and with the trading companies and financial agencies, should get itself into a firm position for the long haul, in order to overcome its difficulties. But may it not be necessary at this juncture to forget about prestige as the biggest canned tuna exporting country in the

Japan (Contd.):

world, and cut back production temporarily in order to put the industry's house in order?, asks the editorial. (Suisan Keizai, July 22, 1960.)

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FISHERIES AGENCY TO REEXAMINE TUNA FISHERY POLICIES:

Tuna fishing is so much a feature of Japanese overseas fishery developments that it is the first thing the Japanese think of when such developments are mentioned. Recently countries of Southeast Asia, such as New Guinea and Ceylon, have been trying to develop their own tuna fishing industries, and within Japan, too, there is a growing desire to change from coastal fishing to tuna fishing brought on by the recent transfer of vessels from the salmon fishery to the tuna fishery. It appears that the Japanese Fisheries Agency, taking this situation into consideration, is getting set for a fundamental examination of the tuna fisheries and a revision of the present licensing policy. When this is undertaken, it is expected that there will be pressure from the Federation of Tuna Fishing Associations.

The moves being made by New Guinea and Ceylon are natural for countries which are backward in fishery technology. Recently the Ceylonese have asked to buy 20 tuna vessels, and the large number of vessels involved has given the Japanese industry pause. At this rate the South Pacific and Indian Ocean tuna fisheries may in the near future cease to be a Japanese monopoly, and the real wish of the Japanese industry is that insofar as possible such requests should be met by despatching Japanese tuna boats.

In Japan, since the authorities permitted the changeover of some salmon boats to tuna fishing, the coastal fishermen have repeatedly made representations to the Fisheries Agency to permit depressed coastal fishermen to also enter the tuna fishery. In short, the tuna fishing industry is facing an important period of change, both at home and abroad, and the situation can no longer be dealt with under the present licensing policy, which has been repeatedly patched up with partial remedies.

At present the Fisheries Agency sections concerned are thinking in terms of the fishermen who have been squeezed out of their fishing grounds by the "Rhee Line" (between

Korea and Japan) and those who have lost their coastal fishing grounds because of the mysterious "Minamata" disease. They are also examining new licensing policies which would apply to public fishery corporations which are having business difficulties in various parts of the country. These probably can not, however, be solidified into a plan without considerable dissension. (The Fishing Industry Weekly, July 15.)

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FROZEN TUNA EXPORTS LAG:

Japanese exports of frozen albacore and yellowfin tuna to the United States are almost at a complete standstill. This is attributed to the excellent landings by the California converted clipper-seiners, according to the August 8, 1960, issue of The Suisan Tsushin. Due to the good California yellowfin fishery, it is probable that all United States tuna packers have ample raw material on hand. For this reason Japan's export market for yellowfin in the United States, despite the new export price of \$240 a short ton established early in August, is so poor that the agreed price is not being observed. It is reported that offers are already being made at \$230, but even at that price there are no sales contracts being made.

The article also points out that because of the good catch, the price of California albacore was recently lowered from \$375 to \$325 a short ton, but according to advice received by Japanese trading companies, the big California packers have announced that after August 8, they are reducing the price to \$300.

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MARKET FOR TUNA VESSELS WEAKENS:

The recent moves in the direction of a revision of tuna vessel licensing policies have produced unexpected repercussions in the Japanese tuna fishing industry, and the progress of events is being watched. Particular attention is being paid to the activities of the subcommittee of the Fisheries Regime Survey Council, which is gathering concrete data for its meeting in September 1960.

The extension of the tuna fishing grounds to greater distances has stimulated construction of larger vessels, and has given rise to excessive competition in the process. This phenomenon has produced various problems, particularly: (1) the cost per ton for larger

Japan (Contd.):

tuna vessels has risen very high, about 270,000 yen (about US\$750) per ton for 70 gross ton vessels, 250,000 yen (US\$694) per ton for 100-ton vessels, and 230,000 yen (US\$639) per ton for 180-ton vessels; (2) under the Special Exemption Law, medium and small vessels were replaced with larger ones, and the total number of operators was reduced, but despite this there was an increase in the catch, though at the same time domestic processors began to suffer a shortage of raw material; (3) in connection with mothership-type tuna operations, there was a tendency for tuna fishing rights to become concentrated in the hands of large enterprises; (4) a rise in costs brought about by construction of larger vessels and changes in working conditions has had a bad effect on distribution and consumption; and (5) a question had arisen with regard to the suitable size of the tuna fleet, and there is great concern over what measures the subcommittee will work out to meet these problems.

Because of these developments, the trade in tuna vessel construction rights, which has been a seller's market, has shown a slow down of buying, and there are some reports that trading in tonnage rights has stopped. (The Suisan Tsushin, August 3, 1960.)

NEW CANNED TUNA PRODUCT ON MARKET:

A new canned tuna product, "Tender Tuna," which a Japanese processing firm put on the Japanese market late in June 1960, is enjoying good acceptance. Consumption has been about twice as high as expected.

Characteristics which have made the new product a hit with the consumers are: (1) the flavored oil and water sauce in which it is packed can be used in cooking as a flavoring agent; (2) it has a distinctive flavor and a tender texture; (3) it is processed so as to resemble chicken; (4) the tuna meat is packed in the form of blocks; (5) no fish design is used on the label; and (6) it is comparatively cheap.

At present the product is put up in flat No. 2 and No. 3 cans in four different flavored sauces: soy, tomato, stew, and curry. The No. 2 can sells at retail for 55 yen and the No. 3 can for 35 yen (approximately 15

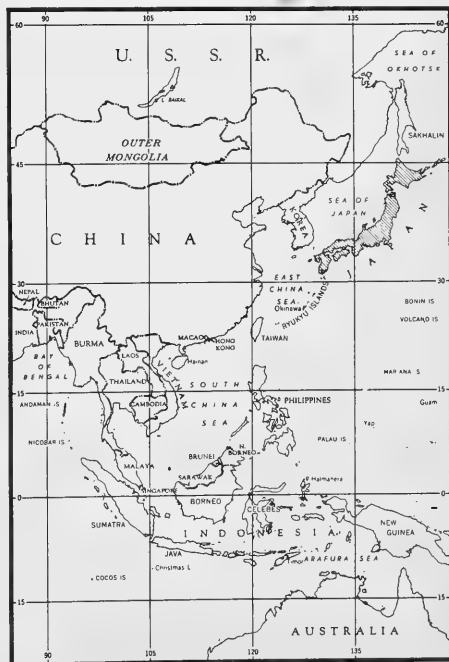
cents and 10 cents, respectively). The Suisan Tsushin, July 20, 1960.)

PURSE-SEINERS DEMAND LICENSES FOR TUNA FISHING:

A big deputation of seiners from western Japan called on the Japanese Fisheries Agency on August 1, 1960, to demand that operators of about 40 seiners be granted tuna-boat licenses totaling 4,000 gross tons to compensate them for being squeezed off their fishing grounds by the Rhee Line. (The Suisan Keizai, August 2, 1960.)

SKIPJACK TUNA LANDINGS LIGHT IN KOCHI PREFECTURE:

Skipjack tuna fishing by Japanese vessels from Kochi Prefecture in July 1960 should have been at its seasonal peak, but the catch was very poor. If it continues at this rate, this may be the poorest season ever experienced.



Japan (Contd.):

According to a survey by the Kochi Prefecture Fisheries Department, there are about 400 skipjack vessels in the Prefecture, including part-time skipjack vessels of less than 5 gross tons, and they are principally based at Tosa Shimizu, Usa, and Suzaki. They fish off the Kochi coast, making trips of at most 2 days, and produce from 3,800 to 5,600 metric tons of skipjack each year.

However, this year the vessels of the Tosa Shimizu Fisheries Association landed from January through May only 78 tons of skipjack, less than one-fourth of the 358 tons landed in the same period last year. Other associations, such as those of Usa and Suzaki, also reported landings of $\frac{1}{4}$ to $\frac{1}{3}$ last year's.

The Experiment Station blames the poor fishing on unfavorable oceanographic conditions, among them lower than average water temperatures and a displacement southward of the Kuroshio Current away from the Japanese Islands. (The Fishing Industry Weekly, July 15, 1960.)

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SUPER TUNA LONG-LINER LAUNCHED:

The Japanese super tuna long-liner No. 1 Seiju Maru was launched on August 10, 1960, at a Shimizu shipyard. The vessel, built at a cost of about 260 million yen (US\$723,000), was started May 21, 1960, and was scheduled to be completed in mid-September. She has 1,680 cubic meters (59,327 cubic feet) of refrigerated hold space and can carry about 1,000 metric tons of tuna. The No. 1 Seiju Maru is 1,175 tons gross, 67.5 meters (221 feet) long, 11.5-meter (37.7-foot) beam, 5.3 meters (17.4 feet) deep. There is one 150-hp. refrigeration machine and two 100-hp. machines. The main engine is 1,700 hp., giving a speed of 14 knots, and fuel tanks are 510 cubic meters (18,010 cubic feet). (The Suisan Keizai, August 10, 1960.)

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TUNA FISHING VESSEL SENT TO OKINAWA IN JULY:

The Japanese Fisheries Agency, which some time ago received a request from the Government of the Ryukyus for Japanese tuna vessels, decided as of July 1, 1960, to send on charter to Okinawa three vessels, the No. 13 Kaiko Maru (352 tons gross), the

No. 28 Yusei Maru (194 tons gross), and the Maguroyama Maru (110 tons gross), the latter vessel to be built in Okinawa.

The Ryukyu Government had asked for the chartering of 3,200 gross tons of deep-sea tuna vessels over a 5-year period, as a means of promoting the fisheries of the Ryukyus. After considering the matter, the Japanese Government decided to permit the supplying of vessels up to a limit of 2,250 tons over a 5-year period, and further decided to send 650 tons by the end of the 1960 Japanese fiscal year. The three vessels are the first part of this tonnage to be sent.

The No. 13 Kaiko Maru sailed for Okinawa late in July, and will be taken over by a local company. Tuna caught in the Ryukyus will be imported into Japan up to a limit of 500 metric tons annually. (The Fishing Industry Weekly, July 15, 1960.)

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TWO MORE TUNA MOTHERSHIPS TO FISH FIJIAN WATERS:

At present two tuna motherships, the No. 3 Tenyo Maru and the Nojima Maru, are operating in the Fiji Islands area. After the wind-up of North Pacific salmon mothership fleet operations, two more ships, the Jinyo Maru and the Koyo Maru were expected to sail for the Fiji area to operate as tuna motherships.

The Jinyo Maru was expected to return to Hakodate on August 5, and arrive at Tokyo before August 10. After unloading salmon, the vessel was to sail for the tuna grounds about August 20. Her fleet will consist of about 50 fishing vessels scheduled to sail from Misaki, and also more than half of the catchers of the Nojima Maru and No. 3 Tenyo Maru fleets will transfer over to this fleet. Planned production is 5,600 metric tons, and the fleet will return to Japan the latter part of November 1960.

The Koyo Maru also was expected to return from salmon fishing about August 5 and to sail for the tuna grounds on August 18. Her fleet of about 60 fishing vessels was expected to arrive on the tuna grounds late in September to take over for the Tenyo Maru, which will return to Japan. The Koyo Maru fleet will fish until next January, when it will again be replaced by the No. 3 Tenyo Maru

Japan (Contd.):

fleet. The production plan is for 5,600 tons. (The Suisan Keizai, August 4, 1960.)

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FROZEN SALMON SHARK EXPORTED TO ITALY:

Large quantities of frozen salmon shark are being exported to Italy as a special product of the Kesenuma area of northeastern Japan. The first inquiries about shark came from Italy to Kesenuma in 1957. At that time the shark was tied in with barter trade for rice and mercury, so the quantity exported to Italy was only 50 metric tons a year, but the product was well received and orders increased rapidly, until this year exports amount to 300 tons. The price of US\$245 per metric ton is as good as that for Atlantic yellowfin tuna.

As a result of this development, the so-called "summer salmon shark," which used to be sold cheap for fish cakes, is now bringing 57 to 58 yen per kilogram (about 7 U. S. cents a pound), twice the usual price in the past, and there are even signs of a shortage in the supply. Kesenuma produces 50 percent of the salmon shark caught off northeastern Japan. (The Suisan Keizai, August 4, 1960.)

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EARNINGS BY CATCHER VESSELS IN NORTH PACIFIC MOTHERSHIP SALMON FISHERY:

The last of the Japanese North Pacific mothership salmon fleets was expected to finish operations August 5 or 6, 1960. Despite the reduction in catch quotas this year, the fishing boats have good earnings because of 20-percent higher salmon prices this year over last year, and because the proportion of reds and chums in the catch was higher than normal. It looks as if the catcher vessels will average 18 million yen (US\$50,040) for the season. In fleets which had a particularly high proportion of red salmon, some vessels have earnings of 21 million yen (US\$58,380). Considering that expenses for outfitting for the season averaged 15 million yen, each catcher vessel is assured a net profit of about 3 million yen (US\$8,340). (The Suisan Tsushin, July 29.)

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NORTH PACIFIC MOTHERSHIP SALMON FISHERY SEASON ENDS:

This year's Japanese mothership-type North Pacific salmon fishing has ended. During this year's Japan-Soviet fishery negotiations, the Japanese salmon catch quota was cut by the Soviets from last year's 85,000 metric tons to 67,500 tons. Furthermore, closed areas were enlarged and finally a special area was closed for this year only. The mothership fishery was allocated 54,000 tons of the catch quota as compared with 70,830 tons in 1959, and each fleet's quota was about 4,600 tons.

In addition to this being a year of low abundance of pink salmon, the beginning of the fishing season was delayed by the negotiations. The fleets did not leave Hakodate until May 19 and fishing did not start until May 25. Although the catch quota had been cut, the closing date of the season was set as August 10, and there was some fear that the quota could not be filled by that date because of the expected scarcity of pink salmon. However, fishing was better than expected, and although pinks were certainly scarce, red and chum salmon were abundant. The Japanese salmon fishermen, while admitting that the abundance of Asian pink salmon was at a low level this year, ascribe their poor catches of the species in part to the action of the Japan-Soviet Fisheries Commission in closing some of the best salmon grounds to high-seas fishing and in requiring the use of large-meshed nets, which allow the pink salmon to escape.

According to preliminary estimates by the fisheries trade journals, the total Japanese salmon catch, including that south of the Japan-Soviet treaty area, will be about 120,000 tons as compared with about 154,000 tons in 1959.

The price of salmon was 20 percent over last year's and the boats appear to have done well financially because of their good catches of high-priced red and chum salmon. Even the mothership operators appear to have come through in reasonably good shape, in what was anticipated to be a money-losing season, because of the shorter fishing period.

A total of 12 mothership fleets with 410 catcher boats participated in this year's offshore salmon fishing--4 mothership and 50 catcher boats less than in 1959.

Japan (Contd.):

According to the accounts of the returning fleet personnel, inspection by the Soviets was rather severe. But the Japanese Fishery Agency's patrol boats were also active in citing violators. Seven boats were caught violating regulations. The Soviets had 13 or 14 patrol craft out, and three 500-ton naval vessels. Most fleets seem to have been inspected about seven times. It is reported that especially thorough inspections were made toward the end of the season. (Nippon Suisan Shimbun, August 10, 1960.)

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INCREASED ALLOCATIONS FOR SALMON ROE IMPORTS PROPOSED:

The Japanese Ministry of International Trade and Industry has requested the opinion of the Japanese Fisheries Agency on increasing the foreign exchange allocation for imports of salmon roe in the Japanese 1960 fiscal year. The Fisheries Agency was of the opinion that the increase would have no bad effects on Japanese producers. Up to the present, the allocation has been US\$100,000, but if 227 metric tons are to be imported in the 1960 fiscal year, \$165,000 would be required, so the Agency will approve the Ministry's scheduled increase of \$70,000.

For the 1959 fiscal year Japanese coastal production of salmon roe is not known (it was 220 tons in 1958), but the salmon mother-ships produced 726 tons. (The Suisan Tsushin, August 2, 1960.)

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SALMON SHARK EXPLORATORY FISHING OPERATION IN NORTH PACIFIC:

According to word received by the Japanese North Pacific Salmon Predator Research Headquarters, the salmon shark fleet (2 long-liners and 4 gill-netters) operating in the Aleutians area had taken a total of 765 shark as of August 9. Examination of the stomach contents showed that 217 shark, or about 30 percent, had eaten salmon. Some of the sharks examined contained 7 or 8 juvenile salmon. The analysis of the stomach contents is being done by an investigator from the Hokkaido Regional Fisheries Laboratory.

The objective of the predator survey fleet is to provide data for the Japanese delega-

tion in the next fisheries conference with the U. S. S. R. However, Japanese fishing industry circles doubt that the expedition will produce results commensurate with its cost of 60 million yen (US\$167,000), which is equivalent to the operating costs of a salmon mother-ship fleet.

According to the North Pacific Mothership Association, in spite of the number of shark taken, there seems to be little likelihood of the survey's producing important data to show how much salmon is being consumed by predators and what the effect of this is on the salmon resources. In this view, the only real result of the investigation is to show where salmon occur most abundantly. (The Suisan Keizai, August 12, 1960.)

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BRISTOL BAY FISH-MEAL FACTORYSHIP PRODUCTION AS OF JULY 31:

As of July 31, 1960, the Japanese fish-meal factoryship fleets in Bristol Bay had produced a total of 30,346 metric tons of fish meal. It is expected that they will meet their total production goal of 50,000 tons in the latter part of October. In addition, the fleets have produced solubles, fish oil, salt cod, and a reported total of 13,816 tons of "frozen products." (The Suisan Keizai, August 2, 1960.)

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FISH MEAL PRICES:

The production cost of Japanese factoryship fish meal during the period when loans are being paid off is about US\$157 a metric ton. After the loans are paid off, it will be \$132 a ton. The 1958 production was all exported at \$171, but only about 40 percent of the 1959 production was exported at \$172 a ton.

These data were revealed in a study of the world fish-meal situation from the Japanese point of view. The study, made by the Japanese Ministry of Agriculture and Forestry, pointed to the low price of Peruvian fish meal. The study apparently concludes that, while continuing efforts to develop export markets, the meal will have to be sold domestically in some way that will not hurt too badly the small producers of crude meal in Japan.

The study also contains some projections to 1969, when it is estimated that Japan's requirements will be equivalent to 882,000 tons of raw fish.

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Japan (Contd.):

FACTORYSHIP FISH MEAL TO BE SOLD ON DOMESTIC MARKET:

The Japanese Fisheries Agency has for some time been considering the advisability of permitting fish meal produced on Japanese factoryships to be sold on the domestic market in Japan. The Agency in mid-August was expected to announce that such meal may be sold domestically under limitations as to quantity and price. On August 9 the authorities called in a representative of the Saury Council and the Fisheries Agency's Production Division tried to persuade him to accept this decision. The chief of the Agency's Products Section stated that release of the factoryship meal on the domestic market would be permitted as soon as the understanding of the various groups concerned was obtained.

It is certain that the factoryship fish meal cannot be exported because of the softening of the world market, and it is clear that there is no way to overcome the situation but to sell the meal domestically at a price that will not be below cost. The domestic groups concerned, although opposed to domestic sale of the meal, are asking that if it must be sold domestically, it be released at such time as to avoid conflict with the saury season. It is expected that the Fisheries Agency will release about 15,000 metric tons, at an estimated price of 53,000 or 54,000 yen (about US\$150 a ton).

During the budgeting of foreign exchange allocations for the second half of the year, the Animal Husbandry Bureau strongly urged the Ministry of International Trade to make an allocation for the import of Peruvian fish meal, but the Fisheries Agency has opposed this, claiming that emergency imports can be made if necessary. The matter is still under negotiation. (The Suisan Tsushin, August 10, 1960.)

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FISHING COMPANIES PLAN TO RAISE POULTRY AND LIVESTOCK:

Three of the largest Japanese fishing companies are planning to establish livestock and poultry farms in Kanagawa Prefecture. One of the companies has already begun construction of a large livestock farm at Atsugi City where some 350,000 chickens, hogs, and cows will be raised. At the same

time, the company is planning a feed factory at the newly-reclaimed Daikoku-cho section of Yokohama. Following this example, the other two fishing companies are both planning to build poultry farms at Sagamihara and feed factories at Daikoku-cho. The primary reason, is the steadily decreasing amount of fish being caught by mainland Japanese fishermen. Also, there is an acute fear among the Japanese companies that the restrictions placed upon Japanese fishermen by other countries, principally Russia and Korea, will become greater, thus further decreasing the annual fish catch.

Chicken-raising on a modest scale has proved successful in Japan previously and the fishing companies are apparently planning to have a portion of their stock raised by independent farmers as well as maintaining their own large farms. These announcements have stirred an interest among the present feed-producing companies in the Yokohama-Kawasaki area. One of the largest feed companies in the district has already announced plans to increase its capacity by expanding its present plant in August and five smaller firms in the area are studying similar expansion programs. This development should expand the market for fish meal in Japan as large quantities are used in poultry and hog rations. (United States Consulate in Yokohama, July 14, 1960.)

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KING CRAB MOTHERSHIP RETURNS FROM BRISTOL BAY AFTER FILLING QUOTA:

The Japanese king crab mothership Tokel Maru (5,385 gross tons), which is jointly operated in Bristol Bay by three large Japanese fishing companies, returned to Hakodate on July 19, 1960, with three of her catcher vessels. The fleet operated with good success for a period of 79 days, and the 80,000-case canned crab meat quota was filled in two days less than last year. The fleet commander stated that the catch rate averaged 17.3 crabs per unit of tangle net, 0.9 crab higher than last year.

The United States fleet appeared to have completed 80 to 90 percent of its fishing before the Tokel Maru fleet reached the grounds. The Soviet fleet was operating on the grounds before the Tokel Maru arrived, and is thought to be still fishing there. As for the prospects for the resource, the fleet commander thought it would be all right with the present single

Japan (Contd.):

Japanese fleet operating, but that two fleets would be too much. (Hokkai Suisan, July 25, 1960.)

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**HERRING-CRAB FACTORYSHIP
REPORTS GOOD CATCHES
IN BERING SEA:**

The Shinyo Maru, operated by a Japanese firm this year as the first Bering Sea combination herring and frozen crab factoryship, had as of July 20, 1960, produced about 900 tons of frozen herring. At first the herring were small, but in July large 6- and 7-year old fish were taken at the rate of about 25 tons a day.

As of July 18, the fleet had also produced 6,179 cases of frozen king crab. In addition, the operation had produced 309 metric tons of flounder, 57 tons of cod, 11 tons of arrow-toothed halibut, 252 tons of rockfish, and 29 tons of other species. (The Suisan Keizai, July 21 and July 22, 1960.)

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**SIX FACTORYSHIPS TO FREEZE
FLATFISH IN NORTH PACIFIC:**

The 1960 season for the Japanese factoryship flatfish fishery in North Pacific waters began in August, and it was decided that this year six freezerships will participate--Kyokuzan Maru, Otsu Maru, Miyajima Maru, Kashima Maru, Chiyo Maru, and Eijin Maru. Three of these fleets completed operating plans, and applications for fishing permits were made to the Japanese Fisheries Agency. The plans are as follows: Kyokuzan Maru will employ 8 trawlers from the ports of Kushiro and Nagasaki. The factoryship expected to sail from Yokohama on August 20, and planned production is 4,450 metric tons.

The Miyajima Maru fleet, with 5 trawlers, expected to sail at the end of August and planned to produce 4,500 metric tons. The Kashima Maru, with 10 trawlers, expected to sail early in September to fill a production plan of 5,000 tons. The Otsu Maru fleet, with 10 to 12 catcher boats, will produce about 7,000 tons. The Chiyo Maru, sailed about August 20 with 8 fishing boats, and will produce 5,000 tons. The Eijin Maru fleet's plan is similar to that of the Chiyo Maru.

There is some uneasiness about the ability of some of the fleets to fill their production plans, as they will be fishing the same grounds exploited by the fish-meal factorship fleets. The fish-meal fleets are taking about 300,000 tons of fish to produce their 50,000 tons of meal, and the frozen flatfish fleets will be taking about 30,000 tons of fish. Even if they fill their production quotas, there is some concern about the effect on the market. This year 3 of the fleets will fish the Bering Sea and 3 the Sea of Okhotsk. It is considered that 6 fleets is about the limit from the point of view of what the resource will support. (The Suisan Keizai, August 5, 1960.)

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**SARDINE CANNERS MAY HAVE
TROUBLE MEETING CONTRACTS:**

Japanese sardine canners have been awarded bids for 23,250 cases by the Philippine National Sales Company (NAMARCO), and an additional 26,750 cases conditioned on ability to produce. Shipment must be made within 45 days after credit is established. But as of late July, the Japan Sea coast was not producing sardines at all, and if this condition continues into September, the contracts cannot be honored.

The four trading companies had to give NAMARCO 20-percent security money, and if they cannot fill the contracts, this will be forfeited. If none of the contract can be filled, the canners will have to pay about 13 million yen (about US\$36,100) in penalties. However, if the canners don't care what price they pay for raw material, they can pack about 10,000 cases.

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**FISH CONSUMPTION SURVEY SHOWS
TRENDS OF FOOD PREFERENCES:**

Some interesting trends in Japanese food preferences are pointed up in a study ("A Survey of the Consumption of Fishery Products") published by the National People's Livelihood Research Association.

In five cities of Japan, 1,910 high-school girls were asked whether they preferred to eat meat and fowl, fish, or whale meat. Of those surveyed, 84.7 percent preferred meat and fowl, and only 22 percent said they liked fish. Only 2.2 percent of the girls expressed a liking for whale meat, and 1.8 percent re-

Japan (Contd.):

plied that they liked neither meat, fish, nor whale.

The study pointed out that the retail price of fresh fish in Japan is by no means low, being higher on the average than in such western European countries as Norway, the Netherlands, and West Germany. Although the Japanese consume more fish per capita than any other people in the world, their consumption of animal protein is the lowest of 26 leading countries. It was found that the high-school girls covered by the survey showed a trend in preference away from traditional Japanese cooking methods in favor of European-style cuisine. (Nippon Keizai Shimbun, July 31, 1960.)

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MACKEREL FISHERMEN CHANGE TO "PORGY" LONG-LINING IN MARSHALL ISLANDS:

There are 24 mackerel pole-and-line fishing vessels in Nagasaki Prefecture, Japan, which have given up fishing in the peak of the season because the distance to the fishing grounds has become too great, and because the heavy catches made by seiners lately have pushed the price of mackerel down to where a pole-and-line vessel cannot make money. These vessels are working as carriers for the seiner fleet or are switching over to long-lining for "porgy" (yellow sea bream).

The owners of the pole-and-line vessels have asked the Fisheries Agency for licenses for lift-net fishing, when the time comes for issuance of new licenses in September 1960, but the hopes for getting these licenses are not bright. Therefore, they are resolving to outfit four vessels of 70 to 80 tons gross as "porgy" long-liners around October 1960 and begin fishing around the Marshall Islands. In this area fish resembling Japanese sea bream and weighing 4 to 6½ pounds each can be caught. An exploratory fishing vessel from Oita Prefecture has already tried this once and had good success. (Nippon Suisan Shimbun, August 1, 1960.)

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OVERSEAS FISHERY OPERATIONS AS OF JULY 1960:

According to a summary of information on Japanese overseas fishery operations by

the Japanese Fisheries Agency, there are a total of 57 ventures, using 102 fishing vessels and 2,438 men. In Central and South America there are 16 operations, mainly trawling and tuna fishing, employing 39 vessels and 821 men. In Southeast Asia there are two ventures, using 24 vessels and 487 men. In the Mediterranean, Australia, and elsewhere there are 20 operations with 39 vessels and 1,130 men.

By type of fishery, the largest category is trawling, with 21 ventures employing 34 vessels. Tuna fishing operations, in Central and South America, Samoa, and elsewhere, total 18, with 47 vessels. There are 11 pearl-culturing and shell-gathering ventures in Burma and Australia, one whaling operation in Brazil, one mackerel fishing venture, one bottom gill-net operation, and three programs for technical assistance to coastal fisheries. The ventures in Central and South America are mainly by large-capital enterprises, while those in Southeast Asia and other areas are principally by medium and small operators, with some participation by big companies. (The Suisan Tsushin, July 30).

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SOVIETS OBSERVE JAPANESE FISHERIES CLOSELY:

The Japanese Fisheries Agency inspector who recently returned from the west Kamchatka crab fishing grounds aboard the mothership Yoko Maru has reported that the Russians are diligently studying the fishery situation and are most assiduous in their efforts to find out about the Japanese situation. According to his report, the Soviets do not change inspection personnel every year, as the Japanese do. They assign the same specialists permanently, and these inspectors study their subject very hard and have a detailed knowledge of the situation, appearing to be much concerned about the future. They are not only interested in Japanese fishing, but show a strong interest in the political side and ask many questions on every subject from personnel to policies.

The Russians use cotton nets and are backward in technique, so they want to know everything about Japanese fishing technology. The Soviet fishermen, seeing the difference between their catches and the Japanese, accuse the Japanese of violating regulations. When the Japanese assert that they have stayed on the prescribed grounds, the Russians say the Japanese charts are incorrect. As a matter

Japan (Contd.):

of fact, it appears that the Soviet charts are more accurate, because they are plotting the ships' position by radar, while the Japanese, who use celestial navigation, apparently do make mistakes. However, when the Japanese ask to see the Soviet plotting charts, they will not show them. The only way to persuade them that the Japanese ships are not off limits is to take celestial observations together. (The Suisan Keizai, July 27, 1960.)

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TRAWLERS FIND GOOD FISHING OFF FOREIGN COASTS:

The trawling operations conducted off Africa, New Zealand, and Australia by a large Japanese fishing company from its Shimonoseki base are going well in all areas. Off northwest Africa nearly 1,000 cases of snapper are caught per day's fishing. Of the company's two 1,500-ton trawlers which are working off Africa, the No. 62 Taiyo Maru is scheduled to return to Shimonoseki September 15, 1960, with about 1,000 tons of frozen fish. The No. 63 Taiyo Maru will remain longer in the area, returning to Japan at the end of next January. Therefore the No. 63 Taiyo Maru's catch will be shipped to Japan by freighter, the first shipment being expected at Yokohama in mid-September.

The No. 3 Taiyo Maru (500 tons gross), which has been operating off northern Australia, has completed fishing on her 5th voyage, and was expected to return to Shimonoseki on August 13 with 16,000 cases of fish. Ever since the first trawler sailed to that area in August 1959, landings have been good on every trip. At present it has become a regular routine to take 32 days for the round trip to and from the grounds, and to fill the ship in 30 days of fishing.

The New Zealand grounds also continue to offer good fishing, and the company's three trawlers which operate there, the 750 gross tons Nos. 56 and 57 Taiyo Maru and the 1,490 gross ton No. 61, Taiyo Maru, are continuing profitable operations, taking catches which run steadily about 60 percent snappers. In August, the No. 61 Taiyo Maru was expected to return to its base with about 1,000 metric tons of fish, having completed a total of 8 trips.

With most of the company's trawlers either working distant grounds or acting as

carriers for the North Pacific fisheries, the company now has only three trawlers still assigned to the East China Sea, and as two of those were in dock during July, there was only one fishing the nearby Japanese grounds. (Nippon Suisan Shimbun, July 25, 1960.)

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NORTH PACIFIC WHALING OPERATIONS, JULY 1960:

The Japanese North Pacific sperm whaling fleet (No. 2 Zunan Maru) completed its catch quota of 1,600 whales on August 1, 1960, after a 2-months voyage. As of that date the baleen whale fleet (Kyokuyo Maru) had taken 689.83 blue-whale units, out of a quota of 800. Production as of August 1 for the No. 2 Zunan Maru was 12,924 metric tons of sperm oil, 4,384 tons of frozen meat, 1,989 tons of salted meat, and 109,511 pounds of liver oil. For the Kyokuyo Maru it was 9,108 tons of baleen whale oil, 16,489 tons of frozen meat, 537 tons of salted meat, and 93,735 pounds of liver oil. The meat is expected to sell for about the same as last season's Antarctic production, 85,000 yen (US\$236) a metric ton.

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WHALING INDUSTRY FAILS TO AGREE ON USE OF FORMER BRITISH FLEET:

On August 1, 1960, Japanese Fishery Agency officials met with representatives of the three Japanese Antarctic whaling companies and the Whaling Association to try to work out an acceptable arrangement for the addition of the recently-purchased British Ba-laena whaling fleet. The conference ended in failure as the Japanese purchasers of the Ba-laena fleet will accept no special conditions limiting operations, and the other two whaling companies refuse to accept her on the Antarctic grounds on an equal basis with the present six fleets. (The Suisan Keizai, August 2, 1960.)

LiberiaMARITIME AND INLAND FISHING REGULATIONS PUBLISHED:

The Liberian Department of Agriculture and Commerce has published the first detailed Maritime and Inland Fishing Regulations to go into effect in Liberia. These regulations establish mandatory license fees, authorize the Bureau of Fisheries to prohibit

Liberia (Contd.):

fishing gear harmful to fishing resources, to close any fishing zone because of overfishing, establish mesh regulations, and require monthly reports from the commercial fishing industry. (United States Embassy in Monrovia, August 5, 1960.)



Mexico

SHRIMP FISHERY TRENDS,
EARLY AUGUST 1960:

A sudden drop in ex-vessel shrimp prices, reopening of negotiations between boat owners and cooperative fishermen, and a late rainy season were among the noteworthy developments in Mexico's shrimp fishing industry during late July and early August 1960.

On August 4, following lower prices in the United States shrimp market (reportedly due to heavy shrimp landings in Texas), Mexican ex-vessel prices at Carmen-Campeche dropped from 11 to 19 U. S. cents a pound. The sizes most heavily hit were 21-35 count, which dropped 16 cents for 21-25 count, 19 cents for 26-30, and 18 cents for 31-35. The smallest drop (11 cents) was for 51-65 count. The remaining size categories dropped 13 cents a pound. The drop in ex-vessel prices was not so sharp on the Mexican west coast. Prior to August 4, ex-vessel prices at Salina Cruz had averaged 10-26 cents a pound lower than those quoted at Carmen-Campeche.

Ex-Vessel Shrimp Prices at Carmen-Campeche and Salina Cruz, August 4, 1960			
Size Count Per Pound	Carmen-Campeche (All Species)		Salina Cruz (Brown Only)
	Independent Vessels	Nonindependent Vessels	
..... (U. S. Cents a Pound)			
U/15 . . .	68	63	50
15/20 . . .	63	63	50
21/25 . . .	55	50	42
26/30 . . .	47	43	35
31/35 . . .	41	39	-
31/40 . . .	-	-	26
36/40 . . .	36	34	-
41/50 . . .	31	29	21
51/65 . . .	26	24	-
51/over . .	-	-	16

The shrimp fishery out of Salina Cruz in early August was in the slack season. The vessels were reported to be averaging around 3,300 pounds for a 12-day trip.

Since the beginning of the closed season on July 16 a long the west coast areas of Sonora-Sinaloa, the Guaymas and Mazatlan boats that are still operating have switched to the west coast of Baja California. The trawling season in the Sonora-Sinaloa area was expected to reopen in mid-September.

Carmen-Campeche landings in July improved slightly over those for June. Carmen landings averaged around 1,700 pounds per trip while those for Campeche were about 1,500. The run of white shrimp in this area which started in mid-June passed its peak during the first week in July. Landings at Carmen during the first week of July averaged over 50 percent whites. For the remainder of the month

whites accounted for about 30 percent of the landings. At Campeche whites dropped from about 10 percent during the first week to less than 5 percent for the rest of the month. For the month Carmen landings averaged about 50 percent pink and those for Campeche were about 90 percent pink.

Carmen shrimp landings, as usual, were of smaller size than those for Campeche. About 40 percent of the shrimp landed at Carmen were 30 count and under, whereas about 70 percent of the Campeche landings were in this size group.

Negotiations between boat owners and cooperative fishermen on the price of shrimp for the 1960/61 season were resumed late in July. The deadline was August 13 and unless an agreement was reached or another extension arrived at by that date, a tie-up on the part of the fishermen was probable.

The late rainy season along the coasts of Sinaloa and Sonora is likely to produce a smaller crop of shrimp than that of the previous two years--which were record ones for that area. As late as July 15 great expanses of nursery-ground areas were still not covered by water. (United States Embassy in Mexico City, August 15, 1960.)

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FISHERY PRODUCTS REQUIRING
IMPORT LICENSES:

Effective June 4, 1960, Mexico has added certain fishery products to the list of products requiring a prior import license from the Ministry of Industry and Commerce. The fishery products included in the list are: (1) crustaceans and mollusks, fresh, chilled, or frozen not specified; (2) preserved tuna, herring, shrimp, crayfish, mackerel, and oysters in airtight containers; and (3) preserved salmon and sardines in airtight containers, weighing with the immediate container up to 5 kilograms (about 11 pounds), provided containers are labeled to indicate contents.

The list of fishery products requiring prior import licenses now includes canned shrimp and other canned fish and shellfish. Smoked, dried, cooked, or salted shrimp were listed prior to the additions made effective by the June 2 regulation.

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IMPORT PERMIT FOR
FISH MEAL REQUIRED:

Effective July 15, 1960, fish meal imported into Mexico was placed on the list of articles subject to prior import permits from the Ministry of Industry and Commerce. This restriction includes the free zones and permit restrictions of the country.

The purpose of this action is to assure that Mexican-produced meal will be utilized before permits will be granted to import foreign meal. It is reported that before this

Mexico (Contd.):

order was issued sanitary permits had been granted for the importation of about 15,000 tons of fish meal (mostly from Peru) since the first of the year. (United States Embassy in Mexico City, August 5, 1960.)



Morocco

FISHERIES TRENDS, APRIL-JUNE 1960:

The Moroccan Central Committee for Marine Fishing met in April of this year to study the problems of fishing in Morocco and to draw up recommendations for presentation to the Government. The subcommittee which examined the status of coastal fishing recommended that construction be begun on trawlers with more powerful motors so that the fishing fleet could keep abreast of the demands of the market. The committee also recommended that studies be begun of the eventual construction of a Moroccan deep-sea fishing fleet. The subcommittee also recommended that the port of Mehdiya (Kenitra) be rebuilt because of its location near the most productive fishing banks.

Export figures for canned sardines were announced during the second quarter. The fish-canning industry, which was pessimistic at the beginning of 1960, is now optimistic. The final export total of canned sardines for

1959 was 29,906 metric tons as compared with 26,468 tons in 1958. France was the largest importer of Moroccan canned sardines (12,475 tons, an increase of 60 percent over 1958). Other large importers were West Germany (5,399 tons, up from 2,500 in 1958); British territories in Africa, 1,839 tons; and French territories in Africa, 2,050 tons. The United States imported 885 tons of canned sardines from Morocco in 1959.

Exports of canned fish for the first four months of 1960 showed an increase over the same period of 1959. *La Vie Economique* of May 20, 1960, without giving specific figures, stated that France remained the principal importer, the devaluation of the Moroccan franc in October 1959 having enabled Morocco to place its canned fish products on the French market at an advantageous price. Following are comparative export figures for the first four months of 1958, 1959, and 1960:

Canned Product	1960	1959	1958
.. (Metric Tons) ..			
Sardines	6,900	7,000	7,100
Tuna	410	350	600
Other	1,750	650	130
Total	9,060	8,000	7,830

The Federation des Industries de la Conserve au Maroc (the Moroccan Canner's Association) signed a contract during the April-June 1960 quarter with the Soviet Union to deliver 65,000 cases of sardines from this year's catch. In 1959, the canner's association agreed to send 35,000 cases to the Soviet Union, but it was unable to deliver more than 15,000 cases since the contract was not signed until too late in the year.

The fish-canning industry is satisfied with the progress of the 1960 fishing season. The supply of fish has been more than adequate, and, there being no serious labor difficulties, no difficulty is foreseen in meeting the demands of the market. In this connection it has been noted that the earthquake at Agadir in February has not affected the supply of fish in Moroccan waters. It was feared that the earthquake might in some way have upset the natural balance of marine life in that area. The good run of fish this year and studies of the ocean floor, which revealed no major changes, have laid these fears to rest. (United States Embassy, Rabat, July 15, 1960.)



Netherlands

WITHDRAWAL FROM WHALING CONVENTION APPROVED BY PARLIAMENT:

The Netherlands Second Chamber of Parliament on July 13, 1960, passed a bill endorsing Dutch withdrawal from the International Whaling Convention. The actual withdrawal took place in the summer of 1959 after the Whaling Commission had refused to grant the Dutch whaling fleet 8 percent of the 15,000 blue-whale units set as the season's maximum total Antarctic pelagic catch. The Minister of Agriculture and Fisheries stated that in fact the Dutch whaling fleet had caught only 6.7 percent of the total number of blue-whale units in the 1959/60 season, while in the previous season it had caught slightly over 6.7 percent of the quota for that season. (United States Embassy in the Hague, July 15, 1960.)

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TWO BILLS ON WHALING PASSED BY SECOND CHAMBER OF PARLIAMENT:

On July 13, 1960, the Second Chamber of the Netherlands Parliament approved two bills concerning whaling. The First Chamber, however, adjourned on July 26 without considering them, so their enactment could not take place until after the First Chamber reconvened on September 13.

The first bill, consisting of only two articles, ratifies the Netherlands' withdrawal from the International Whaling Convention, 1946. (Netherlands withdrew from the Convention effective June 30, 1959.) The second bill prohibits the taking of whales by Dutch vessels without a permit from the Ministry of Agriculture and Fisheries and provides that the issuance of permits shall be subject to regulations designed to protect whale stocks and to further scientific research in this field. The regulations are to be issued by the Minister of Agriculture and Fisheries and may be repealed or amended by him. A procedure for appealing against the Minister's decision is also provided.

The bill concerning Netherlands' withdrawal from the International Whaling Convention is intended merely to ratify action already taken by the Netherlands Government. Should the Government decide in the future to re-adhere to the Convention, it could presumably do so on its own initiative

and then subsequently seek Parliamentary approval, just as it is now seeking such approval for its withdrawal.

The intention of the second bill is to give the Government legal competence to regulate whaling by Dutch vessels, since Dutch whaling is no longer subject to the provisions of the International Whaling Convention or to the regulations of the International Whaling Commission. In explaining the provisions of the bill to the Chamber, Minister of Agriculture Marijnen stated that the Government considers it its duty to cooperate in conserving whale stocks, but he indicated that for the time being there would be no regulations limiting the size of catches or fixing the opening and closing dates of the whaling season.

Debate on the two bills was largely limited to statements by a Socialist member of Parliament known for his interest in conservation. He strongly attacked the Government's withdrawal from the Convention as a coercive measure which did not reflect to the Netherlands' credit in international affairs and characterized the regulations proposed by the Government under the second bill as inadequate for the conservation of whale stocks. (United States Embassy in the Hague, August 1, 1960.)



Norway

FISH MEAL AND OIL INDUSTRY:

Production of fish meal in Norway is based mainly on herring and waste from the fish-filleting plants. As the demand from the rapidly expanding mink farms for filleting plant waste has been increasing, less waste has been available for fish meal. The prices paid by the mink farms for fish waste are substantially higher than those which the fish-meal industry

Table 1 - Norwegian Production of Fish Meal and Oil, 1958-1959

Product	1959	1958
	.. (Metric Tons) ..	
Fish Meal:		
Herring meal	110,000	100,000
Other fish meal ^{1/}	2/	18,900
Total	110,000	118,900
Fish Oil:		
Cold-cleared cod-liver oil . . .	15,900	11,900
Other fish-liver oil	1,400	4,600
Herring oil	40,000	34,000
Total	57,300	50,500

^{1/} Production of solubles included.

^{2/} Not available.

Norway (Contd.):

try can afford to pay. Norwegian winter herring are therefore the principal raw material for reduction into fish meal. The average ex-vessel price for herring in 1959 was 25.75

Table 2 - Norwegian Exports of Fish Oils, 1958-1959

Product and Destinations	1959	1958
	(Metric Tons)	
Raw Herring Oil: Total	625	240
Cold-Cleared Fish-Liver Oil:		
Finland	115	126
Yugoslavia	-	48
Czechoslovakia	571	720
East Germany	-	40
Spain	-	60
Greece	-	90
Italy	-	107
Switzerland	-	60
West Germany	155	185
Austria	58	59
Turkey	440	111
Belgium and Luxembourg	-	40
France	-	72
Netherlands	301	335
Canada	-	11
United States	729	642
Mexico	-	69
Brazil	167	180
Colombia	73	31
Peru	-	25
Indonesia	-	34
Israel	-	59
Others	1,514	579
Total	4,123	3,683
Veterinary Fish-Liver Oil:		
Finland	151	173
Italy	545	522
Switzerland	477	534
Sweden	1,449	1,112
Austria	144	154
Belgium and Luxembourg	-	67
Great Britain	101	-
Denmark	1,353	746
Netherlands	147	160
Mexico	-	130
Brazil	106	135
Peru	-	21
New Zealand	56	49
Hong Kong	138	-
Others	836	460
Total	5,503	4,263
Other Fish-Liver Oil:		
Poland	503	506
Czechoslovakia	1,947	4,407
Spain	594	744
Italy	490	740
Sweden	133	185
West Germany	2,158	772
Austria	-	109
Belgium and Luxembourg	-	197
Denmark	-	25
France	137	218
Netherlands	226	161
Great Britain	72	92
United States	-	241
Mexico	260	293
Brazil	465	215
Israel	75	27
Others	1,712	974
Total	8,772	9,906

kroner per hectoliter (1.8 U.S. cents a pound) compared with 21.78 kroner per hectoliter (1.5 cents a pound) in 1958.

During 1957 production of fish solubles was slightly above 2,000 metric tons. Production has been declining since 1957 and it is now negligible. The reason is that the market price for solubles has been low. The reduction plants have found it more advantageous to mix the solubles with the meal, thereby raising the meal's protein content.

The average prices to the principal export markets as of March 1960 were as follows:

Product	US\$ a Metric Ton
Fish (herring) meal	131
Fish (herring) oil	48

There are approximately 70 reduction plants in Norway with a capacity of approximately 37,200 metric tons per day of raw material.

Imports of raw herring oil amounted to 39,478 tons in 1959 as compared with 6,632 tons in 1958. No other fish body oils were imported.

With a few exceptions, marine oils may be imported free of duty. There is no duty on the following: crude whale oil, crude sperm and bottlenose oil, crude herring oil, crude seal oil, shark-liver oil, and all fish-liver oils. The rate of duty on marine fats, including spermaceti, is 0.16 kroner per kilogram (1 cent a pound).

All types of marine oils are free of import restrictions except refined fats and refined oils which are subject to import licensing by the Ministry of Commerce. (United States Embassy, Oslo, July 12, 1960.)

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EXPORTS AND IMPORTS OF MARINE OILS AND THEIR PRODUCTS; EXPORTS OF HERRING MEAL, 1959:

In 1959, Norwegian imports of all types of marine oils and byproducts amounted to 56,548 metric tons, valued at almost US\$11.0 million. Imports of marine oils exclusively, amounted to 56,547 tons--12,333 tons, or 21.9 percent, of the total was imported from the United States (table 1).

The same year, Norwegian exports of all types of marine oils and byproducts amounted to 186,265 tons, valued at US\$40.9 million, of which 757.3 tons, or 0.5 percent were exported to the United States (table 2). The amount of marine-oil exports to the United States may have been greater, but the exact amount cannot be ascertained because certain categories of exports do not show country-of-destination detail.

The United States was the principal buyer of medicinal cod-liver oils, and also bought some residual fish-liver oils.

Norwegian exports of herring meal in 1959 amounted to 71,101 tons, valued

Table 1 - Norwegian Imports of Marine Oils and Their Products, 1959

Type	Country of Origin	Metric Tons	1,000 Kr.	1,000 US\$
Whale Oil, Crude:	United Kingdom	5,429.5	8,565.4	1,200.0
	Japan	2.7	13.9	1.9
	Total	5,432.2	8,579.3	1,201.9
Sperm and Bottlenose Oil:	Peru	50.1	58.1	8.1
	Total	50.1	58.1	8.1
Herring Oil, Crude:	United States	12,110.2	15,393.5	2,156.5
	Denmark	5,909.3	7,387.0	1,035.0
	Sweden	1,860.5	2,086.9	292.3
	United Kingdom	2,112.8	2,499.5	350.1
	West Germany	15,063.8	19,639.1	2,751.3
	Iceland	1,274.9	1,614.6	226.1
	Portugal	371.3	353.7	49.5
	Morocco	100.1	135.1	18.8
	Portugese W. Africa	180.2	170.3	23.9
	Others	495.3	472.3	66.8
Total	39,478.4	49,752.0	6,970.3	
High Potency (Vitamin A), Fish-Liver Oil:	United States	43.1	1,560.7	218.7
	Netherlands	12.3	279.3	39.2
	Union of S. Africa	792.3	1,976.5	276.9
	Japan	106.7	2,436.3	341.3
	Canada	5.4	169.5	23.7
	Others	1.5	2.4	0.3
	Total	961.3	6,424.7	900.1
Medicinal Cod-Liver Oil:	Denmark	511.6	784.8	110.0
	Total	511.6	784.8	110.0
Veterinary Fish-Liver Oil:	Denmark	-	0.1	1/100
	West Germany	0.1	0.7	1/100
	Total	0.1	0.8	-
Industrial and Mixed Fish-Liver Oil, Pale:	France	17.0	23.1	3.2
	United Kingdom	56.5	77.2	10.8
	Iceland	4,992.3	6,950.1	973.8
	Peru	353.1	331.1	46.4
	Others	0.5	0.8	0.1
	Total	5,419.4	7,382.3	1,034.3
Industrial and Mixed Fish-Liver Oils, Red	Iceland	1,579.7	2,188.4	306.6
	Peru	125.0	126.3	17.7
	Others	0.4	0.9	0.1
	Total	1,705.1	2,315.6	324.4
Residual Fish-Liver Oils:	United States	178.5	98.6	13.9
	Sweden	1,446.0	736.1	103.1
	West Germany	573.9	304.2	42.6
	Total	2,198.4	1,138.4	159.6
Refined Marine Oil Edible:	Iceland	50.0	60.1	8.4
	Total	50.0	60.1	8.4
Other Marine Oils:	Denmark	25.8	26.3	3.8
	West Germany	200.1	1,105.6	154.9
	Union of South Africa	4.8	107.4	15.0
	Japan	3.6	190.0	26.6
	Peru	505.2	480.5	67.2
	Total	739.5	1,909.8	267.5
Total Marine Oils	56,547.1	78,406.4	10,984.7	
Refined Marine Fats:	Sweden	0.9	1.6	0.2
	Total	0.9	1.6	0.2
Other Marine Fats:	West Germany	-	0.1	1/100
	Total	-	0.1	-
Spermaceti, Crude, Pressed or Refined:	West Germany	0.3	1.7	0.2
	Total	0.3	1.7	0.2
Grand Total		56,548.3	78,409.8	10,985.1

1/ Less than US\$100.

Norway (Contd.):

Table 2 - Norwegian Exports of Marine Oils, and Their Products, 1959				
Type	Country of Destination	Metric Tons	1,000 Kr.	US\$ 1,000
Whale Oil, Crude	Total	92,719	131,421	18,412
Sperm and Bottlenose Oil, Crude	Total	13,408	14,890	2,086
Seal Oil, Crude:	Finland	13	22	3
	Sweden	4	7	1
	France	196	304	43
	Italy	5	7	1
	Netherlands	2	3	1/
	West Germany	3,016	4,069	570
	Others	12	22	3
	Total	3,248	4,434	621
Herring Oil, Crude:	Italy	18	22	3
	Czechoslovakia	94	94	13
	West Germany	465	488	68
	Austria	21	25	4
	Australia	27	36	5
	Total	625	665	93
Medicinal Cod-Liver Oil:	United States	729	1/1,552	217
	Finland	115	354	50
	Netherlands	301	592	83
	Czechoslovakia	571	1,193	167
	Turkey	440	1,061	149
	West Germany	155	357	50
	Brazil	167	335	47
	Others	1,691	3,582	502
	Total	4,169	9,026	1,265
Veterinary Cod-Liver Oil:	Denmark	1,353	2,244	314
	Finland	515	306	43
	Sweden	1,449	2,226	312
	Italy	545	825	116
	Netherlands	147	244	34
	United Kingdom	101	159	22
	Switzerland	477	715	100
	Austria	144	229	32
	Hong Kong	138	237	33
	Brazil	106	164	23
	Others	528	1,559	218
	Total	5,503	8,908	1,247
Residual Fish-Liver Oils:	United States	28	21	3
	Denmark	9	8	1
	France	53	35	5
	Italy	79	87	12
	Spain	32	38	5
	United Kingdom	78	53	7
	West Germany	223	124	18
	Brazil	86	102	14
	Mexico	104	114	16
	Others	11	12	2
	Total	703	594	83
Marine Oils, Refined, Edible:	Denmark	158	287	40
	Sweden	77	146	20
	France	231	457	64
	West Germany	406	695	97
	Panama	140	257	36
	Others	14	26	4
	Total	1,026	1,868	261

/Less than US\$1,000.

(Continued on the following page.)

Norway (Contd.):

Type	Country of Destination	Metric Tons	1,000 Kr.	US\$ 1,000	
Marine Oils, Refined, Inedible:	Sweden	41	76	11	
	France	375	588	82	
	Italy	245	374	52	
	Spain	303	523	73	
	Switzerland	27	44	6	
	Czechoslovakia	950	1,316	184	
	West Germany	37	61	9	
	Austria	35	70	10	
	Brazil	264	424	59	
	India	22	35	5	
	Israel	13	23	3	
	Pakistan	15	22	3	
	Others	32	65	9	
	Total	2,359	3,621	506	
Other Fish-Liver Oil, Except Residual and Brown Oil:	Sweden	133	387	54	
	France	137	382	54	
	Italy	490	720	101	
	The Netherlands	226	1,016	142	
	Poland	503	708	99	
	Spain	594	1,069	150	
	United Kingdom	72	1,296	182	
	Czechoslovakia	1,947	2,921	409	
	West Germany	2,158	2,920	409	
	Israel	75	317	44	
	Mexico	260	372	52	
	Brazil	465	697	98	
	Others	1,712	2,764	387	
	Total	8,772	15,569	2,181	
Marine Oils of All Kinds, Boiled, Oxidized, Sulphurated, Blown or Polymerized by Heat in Vacuum or in Inert Gas:	Denmark	137	246	34	
	Finland	130	246	34	
	Sweden	46	94	13	
	Belgium & Luxembourg	7	11	2	
	West Germany	111	198	28	
	Netherlands	76	122	17	
	Greece	16	24	3	
	Algiers	114	199	28	
	Indonesia	14	28	4	
	Pakistan	27	54	8	
	Others	1/	1	1/	
		Total	678	1,223	171
		Total Marine Oils	133,210	192,219	26,926
Edible Marine Fats and Oils, Hydrogenated:	Total	44,651	85,111	11,924	
Other Marine Fats and Oils, Hydrogenated:	Total	8,329	14,137	1,981	
Spermaceti, Crude, Pressed or Refined:	Italy	11	42	6	
	Czechoslovakia	6	27	4	
	Poland	6	26	4	
	Rumania	2	10	1	
	Others	7	31	4	
	Total	32	136	19	
	Spermaceti, Other Total	32	42	6	
	Other Marine Oils and Fats, Crude or Refined Total	11	14	2	
	Grand Total	186,265	291,659	40,858	

1/Less than 1,000 tons and US\$1,000.

Norway (Contd.):

Table 3 - Norwegian Exports of Herring Meal, 1959.

Country of Destination	Metric Tons	1,000 Kr.	US\$ 1,000
Herring Meal:			
Sweden	4, 601	5, 794	811.8
Belgium & Luxembourg	6, 125	7, 639	1,070.2
France	12, 637	15, 280	2, 140.7
Italy	2, 362	2, 890	404.9
Netherlands	6, 995	8, 857	1,240.9
United Kingdom	25, 361	31, 694	4, 440.3
Switzerland	1, 077	1, 391	194.9
West Germany	5, 138	6, 444	902.8
East Germany	2, 360	3, 061	428.8
Austria	1, 687	2, 077	291.0
Others	2, 758	3, 364	471.3
Total	71, 101	88, 491	12, 397.6

at US\$12.4 million or close to US\$174.36 a metric ton. None was shipped to the United States (table 3). (United States Foreign Agricultural Service Report, Copenhagen, April 12, 1960 and July 27, 1960.)

Note: Values converted at rate of 1 Norwegian krone equals US\$0.1401.

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FISHERIES TRENDS, APRIL-JUNE 1960:

Total landings from the Norwegian cod fisheries during the second quarter of 1960, declined to 40,475 metric tons from about 63,638 tons for the same period of 1959. Total cod landings January 1-June 18, 1960, were only 111,059 tons as compared with 139,649 tons during the same period of 1959. The five-year average for 1955-1959 was 136,482 tons.

The Parliament on June 2, appropriated 20 million kroner (US\$2.8 million) to aid fishing vessel owners who have encountered financial difficulties as a result of the failure of the winter herring fisheries during the last three years. The money is to be used for low-interest loans to the owners for maintenance, repair, and purchase of fishing equipment.

North Norway fishermen have persisted in their demand that the Government should extend the fishing limit to 12 miles. Following the breakdown of the Law of the Sea Conference at Geneva, the Norwegian Foreign Minister stated in the Storting that Norway would in time move to extend its territorial waters for fisheries purposes. West Coast fishermen have objected to this announced delay by the Government. The Minister of Fisheries subsequently indicated in a press statement that it was not likely any exten-

sion would occur before 1961. Meanwhile, the Norwegian Government has undertaken bilateral discussions with the United Kingdom on fishing limits. (United States Embassy in Oslo, report of July 19, 1960.)

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WHALING INDUSTRY TRENDS, JULY 1960:

The Norwegian whaling expeditions participating in the 1959/60 Antarctic pelagic whaling season ended operations on April 7, 1960, with production sharply below that of the preceding season. Total whale-oil production dropped from 118,800 long tons in the 1958/59 season to 98,000 tons in 1959/60, and sperm-oil production dropped from 14,000 tons to about 10,600 tons. The drop in production is reported to be due to stormy weather and to declining whale stocks.

No official statement as of mid-July had been made on Norway's participation in the 1960/61 whaling season in the Antarctic. However, newspaper articles have pointed to the possibility of a reduction in the number of Norwegian expeditions because of the generally unfavorable results of the past season. These articles appeared after it had been announced that the International Whaling Commission at its London meeting in June had recommended the suspension of the over-all whaling quota for the next two years, subject to the retention of national quotas.

Although Norway is no longer a member of the International Whaling Convention, the Government nevertheless sent an official observer to the London meeting. As of the end of June the Norwegian Government had given no public indication of its reaction to the Commission's recommendation. (U. S. Embassy in Oslo, July 19, 1960.)

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NORWEGIAN COMPANY SELLS LAND-BASED WHALING STATION:

According to recent press reports, a Norwegian firm of Tønsberg, Norway, has sold its land-based whaling station, Husvik Harbour, in South Georgia, together with the supply ship Teie and two catcher boats. (United States Embassy, Oslo, August 19, 1960.)



Panama

FISH MEAL AND OIL INDUSTRY:

There are two fish-meal plants in Panama, one on Taboga Island and the other at Puerto de Caimito, about 15 miles west of Panama City. Each plant has a capacity of 8 to 10 short tons of raw fish per hour. Both have unloading pumps. The Taboga plant dries by hot air through a cyclone dryer, reputedly the only one in Latin America. The Caimito plant uses indirect heat from steam to dry the fish meal. The cooker and press of the Taboga plant are used equipment from the United States, and the dryer was constructed locally. The machinery of the Caimito plant was all used previously in the United States. Both plants now use settling tanks for separating the oil but expect to install centrifuges to improve the quality of the oil in the near future. The two plants have no plans at present to utilize the stickwater or for the production of fish solubles.

The Taboga plant started with the idea of using the fish caught by the shrimp trawlers, but soon abandoned this as impractical and turned to purse seines for catching anchoveta or "sardina agallona" (*Cetengraulis mysticetus*) and thread herring or "arenque" (*Opisthonema libertate*).

In 1959 about 9,500 short tons of fish were processed which yielded an estimated 2,000 tons of fish meal. The composition of the catch used for reduction was about 62.5 percent anchoveta and 37.5 percent thread herring. The processors much prefer the thread herring to the anchoveta as it is easier to work and yields a greater percentage of oil. If the anchoveta is not strictly fresh, it is difficult to press and the resultant meal contains a very high oil content. At times it is impossible to press at all unless mixed with thread herring or very fresh anchoveta. This same complaint against anchoveta was encountered in Venezuela. Neither in Venezuela nor in Panama do the plants use formalin and/or sodium nitrite. It is likely, however, that these preservatives will be used in Panama in the near future.

The fish oil produced by the two reduction plants is sold locally, reportedly for soap making. The producing plants do not analyze the oil. Oil yield varies considerably depending upon the species and condition of the fish. The thread herring, it is claimed, produces more oil than the anchoveta. Recovery of as much as 6 percent, on a raw-fish weight basis, has been reported for thread herring. At times no oil is recovered from anchoveta.

Generally a higher protein percentage is yielded by thread herring meal than by anchoveta meal. Anchoveta meal usually runs between 60 and 65 percent protein and thread herring between 65 and 70 percent.

Product	Anchoveta	Anchoveta	Thread Herring
	(Percent)		
Protein ..	59.0	65.60	67.10
Fats	12.0	4.06	2.75
Moisture . .	6.7	8.10	6.07
Sand	0.7	0.55	0.13
Salt	0.6	0.23	0.30

The vessels used in the fish-meal industry are factory-owned. Only two vessels were operating in late June as the Taboga plant was shut down for repairs. The Caimito plant has only one purse-seiner, but is purchasing the catch from another vessel at a reported US\$10 a short ton. The same price is paid for thread herring as for anchoveta. Paper-lined burlap bags holding 100 pounds of fish meal are made locally and cost 30 cents each.

The price of local fish meal depends upon whether it is sold in small amounts or in quantity lots, and whether it is picked up at the plant or delivered to the buyer's warehouse. One firm quoted a price of 7 U. S. cents per pound for fish oil.

Quantity	Delivered at Plant	Delivered to Customer's Warehouse
		(US\$)
Up to 1 ton	-	140.00
2 to 5 tons	-	135.00
Up to 5 tons	130.00	-
More than 5 tons . .	125.00	130.00

The Panamanian fish-meal producers are well protected by tariff. Import duty on fish meal is US\$0.20 per gross kilo plus one percent of the f.o.b. valuation at port of embarkation. On fish meal valued at \$100 a short ton at port of embarkation, the per-ton duty would amount to over US\$182.

No severance tax is charged for catching fish for reduction purposes. There are no export duties or restrictions on exports. Although one government source stated that there were no restrictions on imports of fish meal other than duties, the producers claimed that imports are not allowed if local fish meal is available.

In spite of heavy import duties, during 1959 Panama imported about 1,700 metric tons of fish meal and exported about 1,400 metric tons. The producers operated only during part of 1959 and for about five months no local fish meal was available; consequently, imports were permitted. It was reported that supplies of this imported meal were still on hand in late July 1960 and sales of local meal were moving slowly. According to official records, no fish meal was imported during 1958.

The Caimito plant recently installed a pump for unloading fish, but the problem still remains that only 2 or 3 hours at each high tide are available for unloading. The plant is under new management and plans are being considered for providing longer unloading periods and at least two additional vessels for its fleet.

The Taboga plant, during the height of the 1959 season had five seiners working. Three of these have been converted to shrimp trawling because of the amount of fish meal on hand and world marketing conditions.

Panama fish-meal producers claim that the local market absorbs less than 1,000 tons of meal a year. Local consumption probably will increase since it is understood that the government is sponsoring programs for increasing poultry and livestock raising.

There appears to be sufficient raw material available for the two Panama plants to supply the country's present and future fish meal needs for some time to come. With the current world price of meal, Panama producers claim they cannot now export at a profit. When marketing conditions improve, Panama should be in a position to export several thousand tons of fish meal a year. It does not seem likely that Panama will ever be able to export large quantities of fish meal since the supplies of raw material appear to be limited, according to a July 29, 1960, dispatch from the United States Embassy in Mexico City.



Portugal

FISHERY TRENDS, JULY 1960:

As of mid-July 1960, the Portuguese fishing season was not sufficiently advanced for accurate assessment of the prospects for 1960. However, the catch on the Greenland Banks, where the cod-fishing fleet was fishing in July, was much more favorable this year. This is welcome news after the poor catches of 1958 and 1959. According to reliable sources, the cod-fishing fleet caught fish at a rate of 50 percent higher than that of the 1959 season, in which the catch was 53,344 metric tons of wet-salted cod. Dried cod was in adequate supply for consumers during the second quarter of 1960 and the press has not reported further incidents of hoarding and sales at prices above those fixed by the government.

Reports from the sardine fishing areas indicated that the catch promises to be a large one again this year, but this will remain uncertain until after the important months of August and September. Preliminary figures on the sardine catch for January-May provided by the Fisheries Commission show a total of 15,314 tons as compared with 11,586 tons for the same period of 1959.

Prices paid for sardines have been higher this year. During the first quarter, the value per ton of the respective catches was about 3,652 escudos (US\$127.69) a ton for 1960 as against 2,619 escudos (US\$91.57) a ton during the first quarter of 1959. One factor in the higher prices paid this year is the substantial reduction of stocks of canned sardines which had affected the market, particularly in the northern part of the country, ever since the high production years of 1957 and 1958. The reduction of those stocks is a healthy development which should make for a more orderly market.

Canned fish production in the first quarter of 1960 exceeded that of 1959. According to official statistics, 2,295 tons of sardines and 504 tons of tuna were produced as compared with 1,907 tons and 126 tons, respectively, in 1959. Canned anchovy production, however, is less so far this year. Production is thought to be affected by the large volume of 1959 production and exports (6,210.4 tons), and the relatively low prices obtained recently for anchovies. Exports of canned fish declined during the first quarter of 1960, and canned sardine exports were 11 percent less than in the first quarter of 1959.

The Portuguese Government by Decree No. 43056 of July 8, 1960, authorized the Fund for the Renovation and Reequipment of the Fishing Industry to issue its third series of bonds to finance projects under the Second Six-Year Development Plan. The new financing is in the amount of 24 million escudos (US\$840,000) and is not earmarked for specific projects, but will assist in the financing of any projects which may have been included in the development plan. (United States Embassy report from Lisbon, July 22, 1960.)

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FISHING INDUSTRY RENOVATION AND REEQUIPMENT BOND ISSUE AUTHORIZED:

The Portuguese Ministries of Finance and Navy have published a joint decree (No. 43056 published in the *Diario do Governo* of July 8, 1960), authorizing the issuance of bonds to a total of 24 million escudos (US\$840,000) bearing an interest rate of 4 percent for the use of the special Government Fund for the Renovation and Reequipment of the Fishing Industry. The Fund au-

thority is also authorized to make appropriate arrangements with the Caixa Geral de Depósitos, Crédito e Previdência or any other national credit institution for the sale of these bonds either to said institutions or to the public. (United States Embassy, Lisbon, July 21, 1960.)

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FISH MEAL AND OIL INDUSTRY:

Production of fish meal in Portugal is small. In 1958, the most recent year for which statistics are available, 230 metric tons of fish meal and 150 tons of fish oil were produced. Both meal and oil are produced almost exclusively from waste of sardine canneries.

The fish meal and oil industry in continental Portugal is an adjunct to the sardine canning industry rather than an industry in its own right. There is no fishing of any importance directly for the reduction plants.

There are no special government aids to the industry and no special taxes or restrictions on foreign trade. As might be expected from the type of production, there are practically no exports. On the contrary, some imported Angolan fish meal is consumed in continental Portugal. There is also a substantial transit trade in fish meal from the Portuguese African provinces through metropolitan Portugal to European countries, chiefly Germany.

It may be of interest to mention the prices currently quoted in Lisbon for Angolan fish meal and oil. Angolan fish meal with a protein content of 60 percent or more, and without a guarantee as to the absence of salmonella, is quoted at about \$70 per metric ton f.o.b. Angola. Fish oil is currently quoted at 10.5 to 11.2 U. S. cents (3.00 to 3.20 escudos) per kilo f.o.b. Angola.

Two of Portugal's cod trawlers and four high-seas trawlers have pilot installations on board for the production of fish meal. Annual production of these vessels is estimated by a trade source at about 10 metric tons. (United States Embassy, Lisbon, August 5, 1960.)



Sierra Leone

FISHING INDUSTRY DEVELOPING RAPIDLY:

Tuna: In recent months large schools of tuna have been found in the Atlantic Ocean well outside the territorial waters of Sierra Leone (in West Africa next to Liberia), but within easy reach of Freetown, the capital, states an information release by the Sierra Leone Department of Information.

United States and Japanese tuna fishing vessels have undertaken exploratory surveys in the coastal waters with the result that a large United States tuna canning firm has started buying tuna from Japanese and Spanish clippers in Freetown. The landing and storage are carried out by an Italian firm at Kissy, near Freetown, for ultimate shipment to the United States.

Between January 20 and May 24 this year, 30 tuna vessels arrived in Freetown. At present 29 Africans are permanently employed by the Italian firm for handling tuna.

According to the news release, this could be the beginning of a new industry. If a cannery can be set up in Freetown (which has the best natural harbor in West Africa) and worked with local labor, Sierra Leone canned tuna might one day bring a valuable income from the markets of the world.

The officer-in-charge of the Sierra Leone Government Fisheries Development and Research Unit states that, "the future of the fishing industry in Sierra Leone is tuna; it's a big earning crop and it is highly valuable."

Other Fishery Developments: From an undeveloped industry which mainly consisted of indigenous fishermen going out to fish in small canoes, Sierra Leone's industry has developed into an organized industry. This progress is reflected in the increase in the tonnage and value of fish landings; the techniques, the encouragement by Government of foreign firms, and the benefits accrued from research carried out by the Government Fisheries Development and Research Unit at Kissy, which replaced the West African Fisheries Research Institute in October 1957.

In 1959, landings by ten trawlers were about 273,301 cases of demersal fish, weighing about 2,375 metric tons and having a

landed value of £146,796 (US\$411,000). The species landed included skate, shark, ladyfish, whiting, gwangwa, sheephead, crocus, snapper, catfish, and sole.

Total fishery landings in Sierra Leone for 1959 are estimated at 23,750 metric tons, compared with an estimate of 5,000 tons in 1945.

In Sierra Leone there has been an enormous increase in the number of fishermen--there are now about 3,000 bonga canoes, where there were only 300 in 1945. Yeligungu nets are now used for bonga fishing as well as the original cast nets, and the latest novelty is the Ghanaian "all-net."

At Lumley Beach and at Murray Town (about 4 miles from Freetown) trawlers land their catch. In 1945 there were no trawlers in Sierra Leone; now there are 10, some owned by European companies, others by Africans.

The Government encourages foreign investors, especially those who welcome Sierra Leonean participation and provide training facilities for Sierra Leoneans. This policy has yielded good results.

One of the fishing companies participating in Sierra Leone's fishing industry was originally formed in Liberia seven years ago. The company started operating in Sierra Leone in December 1959 when it bought up an Italian firm. Its headquarters are at Murray Town. It owns 3 large trawlers which go out fishing every other day and 2 small ones which fish daily. They go as far as 60 miles down the coast. This company has a staff of 14 Italians and 100 Sierra Leoneans who are employed as fishermen, net menders, carpenters, machinists, mechanics, salesmen, and clerks. It has two stores in Murray Town.

There are other fishing enterprises in Sierra Leone run jointly by foreign and local capital. One example of this is one in Sawpit, Freetown.

Sierra Leone is the only country on the West Coast of Africa which has passed legislation to conserve its fisheries. The Fisheries Development and Research Unit has implemented protective measures to prevent overfishing. Big trawlers are not allowed to fish within one mile of the coast and in any of the estuaries. The Unit has introduced

Sierra Leone (Contd.):

set nets to charter boats and it conducts fish preservation experiments. In addition, it carries out biological work to assist in the implementation of mesh-size regulations.

Fishing boats 28 feet long built in Ghana are made available to local fishermen by the Unit. Applications are received from local fishermen, and successful applicants are given a loan which they repay under a revolving loan scheme. Local fishermen are also trained by the Unit. The fishing boats are for the development of inshore fisheries. The Unit helps indigenous fishermen with set nets. Those with money buy the charter boats which cost £1,700 (\$4,800) each.

Sierra Leone's fishing industry falls into two categories: (1) inshore fishing which consists of the charter boats and the large Italian-type trawlers; and (2) the offshore pelagic fishery for tuna.

A recent successful introduction has been the set net which is now in great demand by Sierra Leone canoe fishermen and promises to be a useful means of increasing their catch rate. (United States Consulate, Freetown, July 27, 1960.)



Turkey

TERRITORIAL WATERS LIMIT SET FOR NAVIGATION AND FISHING:

According to a report published in the Greek fisheries periodical *Alieia* (July 1960), the Turkish Committee of the National Salva-



tion of the General Gioursel Government has voted a new law for Turkish territorial waters. The law fixes Turkish territorial waters at six nautical miles for navigation and 12 nautical miles for fishing.



Union of South Africa

IMPORTS AND EXPORTS OF FISHERY PRODUCTS, 1959:

In 1959, the Union of South Africa imported almost 11.9 million pounds of fish and shellfish products valued at US\$4.1 million. The same year the Union of South Africa exported 132.9 million pounds of edible fish and shellfish products, valued at \$28.7 million; 5.8 million Imperial gallons of fish-body and liver oils, valued at \$3.9 million; and 219.2 million pounds of fish meal, valued at \$13.0 million.

Table 1 - Union of South Africa Imports of Fish and Shellfish Products, 1959

Item	Quantity 1,000 Lbs.	Value	
		£	US\$
Fish Fry and Ova:			
Total		207	579
From United States	N. A.	90	252
Caviar, Lox, Lobster & Anchovies:			
Total	389.3	112,226	313,672
From United States	1.0	910	2,543
Fish Paste:			
Total	279.8	66,285	185,266
From United States	-	66	184
Sardines in Oil, Canned (Includes Sild, Brisling, and Sildines):			
Total	3,746.9	482,522	1,348,648
From United States	-	-	-
Other Preserved, Canned Etc.:			
Total	1,303.3	164,980	461,119
From United States	27.3	11,902	33,266
Salmon, Canned:			
Total	1,206.1	208,607	583,057
From United States	3.8	1,137	3,178
Fish, Fresh, South African-Caught:			
Total	532.1	131,909	368,686
Fish, Fresh, not South African-Caught:			
Total	450.4	39,665	110,864
From United States	-	-	-
Fish, Dried, Salted and Cured:			
Total	3,384.9	191,682	535,751
From United States	3.1	530	1,482
Fish, Preserved, not Canned:			
Total	582.9	77,524	216,680
From United States	5.9	1,757	4,911
Grand Total	11,875.7	1,475,607	4,124,322
Grand Total from United States	41.6	16,392	45,816

N. A. - Not Available.

Union of South Africa (Contd.):

Table 2 - Union of South Africa Exports of Edible Fish and Shellfish Products, by Country of Destination, 1959

Product and Destination	Quantity 1,000 Lbs.	Value	
		£	US\$
Fish, fresh and frozen:			
United States	361.3	19,554	54,654
United Kingdom	1,351.2	82,421	230,367
Australia	10,175.3	608,676	1,701,249
Nigeria	238.9	6,866	19,190
Rhodesia and Nyasaland	6,207.6	289,131	808,121
Mozambique	868.5	26,629	74,428
Angola	619.5	16,651	46,540
Ships' Stores	608.0	49,395	138,060
Mauritius	536.0	24,510	68,505
Others	414.7	18,853	52,694
Total	21,381.0	1,142,686	3,193,508
Filchards, canned:			
United States	458.5	21,157	59,134
United Kingdom	23,679.6	1,258,656	3,517,944
Ceylon	1,621.2	62,262	174,022
Malaya	8,465.7	413,984	1,157,086
Ghana	12,125.7	686,466	1,918,672
Nigeria	1,246.2	64,513	180,314
Pacific Islands	1,202.0	54,017	150,978
Congo	1,392.7	63,768	178,232
Philippine Islands	24,200.0	1,266,208	3,539,051
Burma	4,152.0	179,003	500,313
Canada	1.5	56	156
Others	7,126.3	376,223	1,051,544
Total	85,671.4	4,446,313	12,427,446
Fish, dried, salted and cured:			
United States	N.A.	3	8
Australia	5,944.0	325,743	910,452
Ghana	1,074.1	44,873	125,420
Mauritius	1,423.5	59,663	166,758
Rhodesia and Nyasaland	501.9	25,308	70,736
Belgian Congo	4,382.9	188,364	526,477
Reunion	134.5	5,991	16,745
Fr. Equatorial Africa	225.0	9,700	27,112
Others	181.8	15,312	42,797
Total	13,867.7	674,957	1,886,505
Spiny Lobster Tails, frozen:			
United States	9,387.5	2,729,979	7,630,291
United Kingdom	80.0	22,000	61,490
Rhodesia and Nyasaland	65.9	20,343	56,859
France	38.1	9,766	27,296
Others	67.5	21,891	61,185
Total	9,639.0	2,803,979	7,837,121
Spiny Lobster, canned:			
United States	185.1	72,912	203,789
United Kingdom	7.5	2,925	8,175
Canada	8.3	3,250	9,084
Belgium	29.8	11,701	32,704
Congo	9.3	3,707	10,361
France	124.4	49,043	137,075
Western Germany	105.7	41,538	116,099
Others	13.7	5,064	14,154
Total	483.8	190,140	531,441
Fish Fry and Ova:			
Total	N.A.	404	1,129
Fish Pastes:			
Total	16.5	3,227	9,019
Fish, other--canned, other than canned, etc.:			
United States	2,719.2	123,402	344,909
United Kingdom	591.0	28,307	79,118
Ceylon	148.6	7,506	20,979
New Zealand	566.1	51,451	143,806
Malaya (Singapore)	402.5	46,542	130,085
Ghana	5,300.1	288,315	805,840
Nigeria	115.4	5,390	15,065
Mauritius	431.9	23,741	66,356

Table 2 - Union of South Africa Exports of Edible Fish and Shellfish Products, by Country of Destination, 1959 (Contd.)

Product and Destination	Quantity 1,000 Lbs.	Value	
		£	US\$
Br. West Indies	428.2	23,853	66,669
Rhodesia and Nyasaland	876.4	53,365	149,155
Pacific Island	1,293.6	66,701	186,429
Congo	530.4	21,203	59,262
Philippines	3,468.7	167,973	469,485
Venezuela	132.0	6,325	17,678
Liberia	867.6	34,340	95,980
Burma	720.0	30,000	83,850
Others	289.1	18,872	52,748
Total	1,808.8	997,286	2,787,414
Grand Total, Edible	132,940.2	10,258,992	28,673,883

South African imports of fishery products from the United States amounted to US\$45,800 or 1.1 percent of the total value of fishery products imported. Exports of edible fish and shellfish products to the United States totaled US\$8.3 million. Frozen spiny lobster tails was the principal fishery product exported to the United States; in fact, the United States bought 97.4 percent of those exports.

Table 3 - Union of South Africa Exports of Fishery Byproducts, by Country of Destination, 1959

Product and Destination	Quantity 1,000 Lbs.	Value	
		£	US\$
Fishery Byproducts:			
Fish Meal:			
United States	23,510.4	475,383	1,328,695
United Kingdom	79,580.4	1,712,297	4,785,870
Canada	660.0	13,200	36,894
Malaya	9,391.0	234,390	655,120
Kenya	829.4	22,140	61,881
Rhodesia and Nyasaland	11,052.8	243,456	680,460
Congo	514.0	10,941	30,580
France	6,346.6	135,070	377,521
Western Germany	32,664.7	633,620	1,770,968
The Netherlands	8,403.2	161,435	451,211
Italy	1,521.0	38,477	107,543
Yugoslavia	12,462.8	276,476	772,750
Philippines	534.5	11,054	30,896
Israel	29,491.8	626,415	1,750,830
Others	2,204.9	48,325	135,069
Total fish meal	219,167.5	4,642,679	12,976,288
Fish-Liver Oil:			
United States	29,276	12,668	35,407
United Kingdom	3,047	4,613	12,893
Norway	149,303	67,727	189,279
Others	3,102	2,632	7,357
Total	184,728	27,640	244,954
Fish-Liver Oil, concentrated--Total	4,619	18,012	50,344
Fish-Body Oil:			
United States	10,215	4,240	11,851
United Kingdom	5,125,757	1,148,653	3,210,485
Australia	31,693	11,002	30,750
The Netherlands	424,964	105,339	294,423
Italy	27,765	9,882	27,620
Others	8,223	3,278	9,162
Total fish-body oil	5,628,617	1,282,394	3,584,291
Grand Total fish oils	5,817,964	1,388,046	3,879,589

The most important customer for all South African fishery products and byproducts in 1959 was the United Kingdom, which dollar-wise imported US\$11.9 million, followed by

(Continued)

Union of South Africa (Contd.):

the United States which imported US\$9.7 million. (U. S. Consulate dispatch, Cape Town, June 29, 1960.)

Note: Values converted at rate of 4:1 equals US\$2.795.

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LANDINGS OF PILCHARD-MAASBANKER AS OF JUNE 30 EXCEEDED 1959 SEASON TOTAL:

The Union of South Africa's commercial fishing industry has had exceptionally good landings of pilchards, maasbanker, and mackerel during the current fishing season. Up to the end of June 1960, about 150 vessels landed 300,000 short tons of pilchards and maasbanker, and 27,000 tons of mackerel. The landings through June exceeded the entire landings for the 1959 season which ended on July 31.

The landings by the Union of South African vessels as of the end of June do not include the South-West African landings, usually equal to the Union's. The next pilchard season will begin in Union waters on January 1, 1961, and the maasbanker and mackerel season on November 1, 1960. (United States Embassy, Pretoria, August 11, 1960.)



Union of South Africa and South-West Africa

FISH MEAL AND OIL INDUSTRY TRENDS, JANUARY-MAY 1960:

The production capacity of fish meal and oil reduction plants in the Union of South Africa and South-West Africa is limited by annual quotas on the pilchard-maasbanker catch. The limit in effect this year in South-West Africa is 310,000 short tons for the combined catch of pilchards and maasbanker. The annual quota limit for pilchards and maasbanker in the Union of South Africa still remains at 250,000 tons. In the event that the landings have not reached the quota limit by September 1, it has been the policy of the South African Division of Fisheries to permit the season to remain open until such time as the limit is reached, or to December 31, the close of the quota year. In theory, fishing vessels may continue catching pilchards and maasbanker until September 1 even though the quota has been exceeded before that date. Actually the 1959 season was declared closed on August 14, due to the high proportion of immature fish being landed and it was voluntarily agreed between industry and the Division of Fisheries that the 1960 season close on July 31 because of heavy landings.

Fishing vessels until June 1960 were paid a uniform price of £4.12.6d. per short ton (about US\$12.95) in the Union of South Africa for pilchards, maasbanker, and

mackerel. Because of the sharp drop in fish-meal prices, fishermen accepted a voluntary 12½-percent reduction for the months of June and July.

Available information indicates that reduction plants in South-West Africa (Walvis Bay) are paying the vessels £4.10.0. (\$12.60) a short ton for pilchards and maasbanker this year.

Fish-meal production by the Union of South Africa for the first five months of 1960 amounted to 61,287 short tons as compared with 39,167 tons produced in January-May 1959. Production of fish meal by South-West Africa January-May 1960 totaled 20,381 short tons, an increase of 27.8 percent from the 15,949 tons produced in the same 5-months period of 1959. The production of fish meal during January-May 1960 by both South Africa and South-West Africa totaled 81,668 tons or an increase of 48.2 percent from the 55,116 tons produced in the same period of 1959. Export prices for fish meal c.i.f. United Kingdom as of mid-1960 were about £35.00 per long ton or US\$87.50 a short ton.

Estimated production of fish oil from January-May 1960 in the Union is 20,000 long tons and 5,000 long tons in South-West Africa. This compares with 11,159 long tons in the Union and 4,201 long tons in South-West Africa for the same period of 1959. Export prices for fish oil c.i.f. United Kingdom in mid-1960 were about £55.00 a long ton or about US\$137.50 a short ton.

Fish-solubles production statistics are not available. A considerable portion of this production is mixed with fish meal. Actual exports of solubles are estimated to be between 2,500 and 3,000 tons per year. The last sale of this item from the Union was made in May 1960 at a price of £45.0.0d. per long ton (about US\$126.00 a long ton or \$110.50 a short ton) c.i.f. Europe.

Aside from the exceptionally large landings of pilchard-maasbanker used in South Africa and South-West African waters, another feature of the present season is the good oil yield. It is estimated that the total fish-oil production for the Union and South-West Africa will amount to approximately 75,000 long tons in 1960.



U.S.S.R.

FISHERY CONFERENCE IN RIGA:

During January 7-9, this year, there was a conference in Riga of fishery people from the northwestern part of the Soviet Union and of scientists from all over Russia. The trade paper *Rybnoe Hozjajstvo*, issue no. 4, 1960, reported that there was good fishing in the Atlantic Ocean in 1959. The catch was 13 percent greater than in 1958 despite smaller herring catches. The average yield, both for herring trawlers and bottom trawlers increased in 1959--"Murmanseld" in Murmansk especially showed good results.

In 1959, 36 medium trawlers each caught over 10,000 hectoliters (930 metric tons) of herring. A trawler from Karelen had the largest catch--12,750 hectoliters (1,186 tons).

The fishing area was enlarged, especially for the medium trawlers, which, in addition

U. S. S. R. (Contd.):

to gill-net fishing for herring in the Norwegian Sea also did well fishing with bottom trawls for groundfish and herring in the Western Atlantic, North Sea, and Barents Sea.



Good catches were obtained in the sardine fishery in the central Atlantic. Vessels from Kalingrad and Kherson took part in that fishery.

There were deficiencies and weaknesses in many areas--especially in the utilization and disposition of vessels and raw material. Also organization and experience were lacking in important areas.

The planned U. S. S. R. goals for 1959 were not met. During the first 9 months barely two-thirds of the active portion of the fleet fulfilled the planned quota. The catch of the remaining vessels was, in part, well under the average for the fleet as a whole.

Personnel, especially in the fleet from Kalingrad and Latvia, were unstable and there was considerable replacement. For example, 80 percent of the captains in Kalingrad's fleet were replaced in 1958/59, and for Latvia there was even greater turnover.

The fishing fleet lost considerable time waiting for the floating factoryships and the motherships as well as when going to and from the fishing grounds. Some of the vessel groups used up to 16 percent of their time in unproductive cruising.

The use of mechanical equipment and fishing gear was not efficient. Expenses were heavy, which led to a significant increase in the cost of fish, especially herring.

The effort to find and utilize new fishing grounds was not given adequate attention. Therefore, too great a concentration of fishing vessels occurred in the Norwegian Sea which led to poorer yields and reduced effectiveness.

The lack of research vessels in the fishery research service hindered, to a great degree, the Kalingrad area in increasing its fishing operations in the central and western parts of the Atlantic.

For 1960, there is foreseen a significant intensification of effort to discover new fishing areas in the northwesterly and central parts of the Atlantic. The scientific institutions--Vairo, Baltiro and Plno--were given the task of developing a concrete plan, by March 10, 1960, for expanding the herring fishery in the northwestern Atlantic areas together with working out a cooperative method for research. To carry out the work the Murmansk and Kalingrad areas are being allotted four vessels of the "Ocean" type.

To meet the increasing demand for research and to discover new fishing grounds, it is considered necessary to build a series of exploratory vessels and fishery research vessels of the "Orlik" trawler-type which was built in East Germany.

It is also considered necessary to expand international cooperation in the fields of fishery research and regulations for the fisheries--especially an intimate cooperation with Poland and East Germany which are said to have greater experience than the Russians about fishing in the North Atlantic and the North Sea.

A further curtailment of the spring herring fishery is considered worthwhile. In its place a maximum number of medium trawlers will fish in the spring and summer seasons for groundfish and herring in the northwestern part of the Atlantic, North Sea, and Barents Sea. A concrete plan has been developed for organizing the 1960 fishing of the medium trawlers for the ocean perch and herring fisheries in those areas. (Fiskets Gang, July 14, 1960)

* * * * *

FISHING FLEET ON NEWFOUNDLAND BANKS:

The biggest fishing fleet ever sent by the Soviet Union to the Newfoundland banks is re-

U. S. S. R. (Contd.):

ported to have arrived this season, putting in the shade the "traditional" fleets of Portuguese, Spanish, and French vessels fishing there.

A total of 160 Russian vessels with total crews of 25,000 are reported to be fishing in the area.

The result is a renewed appeal from the Newfoundlanders themselves that fleet strength should be limited by the International Commission for Northwest Atlantic Fisheries.

As the Russian vessels bring their own supplies, even the advantage of stocking up in Newfoundland has been denied to the islanders. (The Fishing News, July 29, 1960.)



United Kingdom

NEW INTEREST RATES ON FISHERIES
LOANS EFFECTIVE JUNE 20:

The British White Fish Authority announced that, as a result of a recent increase in the rates of interest charged to them by H. M. Treasury, some of their own rates were changed as from June 20, 1960.

The new rates are:--

On loans for not more than 5 years, $5\frac{1}{2}$ percent: no change.

On loans for more than 5 years but not more than 10 years, 6 percent: increase $\frac{1}{4}$ percent.

On loans for more than 10 years but not more than 15 years, $6\frac{3}{8}$ percent: increase $\frac{1}{8}$ percent.

On loans for more than 15 years, $6\frac{1}{4}$ percent: no change.

* * * * *

THREE FREEZER-TYPE TRAWLERS
TO BE ADDED TO FLEET:

British distant-water trawler owners, faced by the dual menace of dwindling catches and narrowing fishing limits, are building what promises to be the world's finest fishing fleet of trawlers for freezing fish at sea.

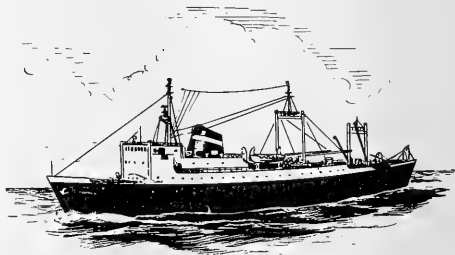
The latest, largest, and most up to date of the vessels has been ordered by a Hull company. She will be the first British side-trawler to freeze the whole of her catch at sea. This means that she will sail farther and can stay out longer, yet her catch will be landed in good condition.

The first all-freeze vessel will be 230 feet in length (214 feet between perpendiculars)--nearly 30 feet longer than the largest British trawlers at present in commission. She will be Diesel-electric powered, and have a hold capacity of 560,000 pounds per trip.

An Aberdeen firm has been given the contract to build the revolutionary new vessel. The vessel will have a freezing capacity of about 49,000 pounds a day. The trawler will be capable of making trips of about four weeks' duration, but it is not certain yet how many men will be carried. The vessel is expected to have a speed of about $14\frac{1}{2}$ knots, and delivery is expected towards the end of 1961.

Two other British companies are already engaged in building freezer-ships. In September 1959 a Hull firm announced its plan to build a super-trawler of 220 feet in length, which will be named the Lord Nelson. She will be launched from a German shipyard this autumn.

The Lord Nelson will freeze only part of her catch. She will be Britain's first distant-water stern-fishing vessel, as distinguished from the Fairtry factoryship-type vessel.



The Fairtry II, a British factoryship trawler.

A third Hull firm has now entered the field, and has also placed an order for a freezer-trawler. This vessel may freeze all or part of her catch, but details of her size and equipment still remain to be decided. Like the first freezer-trawler, she will be built in Britain.

The three Fairtry vessels also freeze their catch at sea, but they are factoryships of more than 2,000 tons. Double the size of an average trawler, they process and fillet their catch on board. They carry a crew of 50 or more, and stay at sea for three months at a time against the conventional trawlers' average of three weeks per trip. (Fish Trades Gazette, July 9, 1960.)



Venezuela

FISH MEAL INDUSTRY:

Venezuela has five fish-meal plants in operation and two under construction. The operating plants are all located on the Gulf of Cariaco and were installed to handle the waste from the sardine (Clupanodon pseudohispanicus) canning

Venezuela (Contd.):

operations. Four of these plants are located in or near Cumana and one is on the Isla Mariquitara. The total capacity of the 5 plants is about 22 tons of raw fish or fish waste per hour. One of the new plants will be located on the Isla Mariquitara and will have a capacity of 5 tons of raw fish per hour. The second new plant will be a floating reduction plant with a capacity of $7\frac{1}{2}$ tons of raw fish per hour.

Four of the active fish-meal plants have used equipment from the United States. The plant with the smallest capacity was purchased new from Denmark. Three of the plants use steam as a source of heat for drying the fish meal and two use a direct flame process.

The operating plants produce fish meal only and no oil or stickwater is saved. Of the plants under construction, one being mounted on a barge—is planned for producing both oil and solubles. The solubles will be put back into the fish meal. The other will produce fish meal and oil but no solubles. Both will use indirect heat for drying the fish meal.

Total consumption of fish meal in Venezuela in 1959 is estimated to have been about 7,000 metric tons. Of this amount, 2,300 tons were produced locally and the remainder imported. The production of fish meal in 1959 was up about 10 percent from the 2,100 tons produced in 1958. No fish oil was produced locally.

Imports of fish body oil during the first 11 months of 1959 amounted to 3.5 tons, valued at US\$2,460. Of this total the United States supplied 1.1 tons, valued at \$1,832 and Norway 2.4 tons valued at \$630.

The bulk of the fish meal is from sardine waste from the fish canneries, but some fish meal is produced from tuna waste. In August 1959, the Government permitted the use of whole "rabo amarillo" (*Centenagrallus edentulus*) for making meal. About 1,500 tons of "rabo amarillo" were taken during 1959, but owing to processing difficulties, only about 180 tons of fish meal were produced.

Of the three types of fish meal, that produced from tuna waste yields the highest protein content and that from sardine waste the lowest. Tuna-waste meal generally has 65-70 percent protein. "Rabo amarillo" runs 60-65 percent, and sardine waste from 50-60 percent.

Most of the fishermen in the sardine fishery are on a straight salary basis during the fishing season, the height of

Year	Metric Tons
1959	2,303.1
1958 ^{1/}	2,100.0
1957	1,479.6
1956	973.2
1955	859.2

^{1/}Approximation.

which is between November or December through July or August. The fishermen are provided with nets (now nylon) and are paid a daily wage of about US\$2.25 a day plus 15 U.S. cents for each trip of fish. The fishermen usually average one or two trips a day and consequently their wage runs between \$2.40 and \$2.55 a day. The factory supplies the fishing gear and picks up the fish. The fishermen provide the labor and their own food.

The nets are beach seines from about 136.7 yards to 328.1 yards long and 19.7 to 26.2 yards deep. The mesh of the body is $\frac{1}{2}$ -inch square and that of the wings 1-inch square. From 10 to 20 or more men are employed for each beach seine.

All fishing is during the day. A lookout is maintained on a hilltop and as a school of sardines approaches shore the fishermen, using non-motored skiffs, are directed from the

hilltop on the setting of the seine. The catch, which may run as much as 400 tons but usually between 15 and 30 tons, is towed to the beach and maintained there alive either in the seine in which it was caught or in a smaller net. If additional fish are caught before the first catch has gone to the cannery the later arrivals are incorporated with the earlier by bringing the net and catch around the first impounded fish and removing the inner net. By this means, if fishing is good, some fish may be in the impoundment for two or three months. The fish are transported to the cannery at night either in motor launches or in barges towed by motor launches.

The "rabo amarillo" is captured in the same fashion as the sardine. It is not taken in the Gulf of Cariaco but along the north shore of the Peninsula de Araya and around the Islands of Coche and Margarita. For "rabo amarillo" the fishermen are paid 25 to 30 bolivars (US\$7.51-9.01) a metric ton. The nets are furnished by the plant.

If a cannery does not have reduction equipment or if its equipment is not operating, the usual practice is to send the cannery waste to another plant where the processing is done for 50 percent of the meal produced.

The Venezuelan Government does not permit the use of whole sardines for making fish meal. Until 1959 (with the exception of a few months in 1957) the use of any whole fish for making fish meal was prohibited. In 1959, after the sardine season was about over, the Government, in attempting to encourage greater fish-meal production, allowed the use of whole "rabo amarillo," "machuelo" (*Opisthonema oglinum*) and bagre (marine catfishes) for meal production.

Product	Tuna Waste	"Rabo Amarillo" (Whole)	Sardine	
			Waste	Waste
	..... (Percent)			
Water	5.9	7.8	6.9	7.1
Protein	68.0	62.3	53.8	56.8
Fat	7.6	9.0	6.4	15.5
Fiber	0.5	0.7	0.6	0.7
Nitrogen-free extract	4.9	0.0	5.6	0.4
Ash	13.1	20.2	26.7	19.5

Import duty on fish meal is high. It is 0.15 bolivars per gross kilogram, which amounts to over US\$41 per gross short ton. Import duty on fish oil (not including cod-liver oil) is also high at 1.20 bolivars per gross kilogram which is over US\$0.16 per gross pound.

Meal in large amounts sells for 500 bolivars a metric ton and in small amounts for 560 bolivars. These prices are f.o.b. plant and amount to about US\$132 and \$152, respectively, a short ton. It is understood that locally produced meal must first be used before meal can be imported.

Although no fish meal is exported from Venezuela, there are no export duties or restrictions on the export of fish meal or fish oil. No severance taxes are charged for catching fish for meal or for canning.

One of the two plants under construction will be mounted on a barge and based at Isla Coche. The equipment for this plant is used machinery of conventional design purchased in the United States. Plans call for producing oil and concentrating the stickwater and putting it back into the fish meal. The fish meal will be dried by indirect heat produced by steam. The principal source of raw material will be "rabo amarillo."

The processing machinery for the Punta de Piedras plant is locally designed and is being constructed locally. The design is somewhat revolutionary in concept in that it is understood that the fish, chiefly "rabo amarillo," will be cut by hand, cooked, drained, pressed under cloth and dried on a

Venezuela (Contd.):

Table 3 - Venezuelan Fish Meal Imports, 1955-58 and First 11 Months of 1959

Country of Origin	11 mos. 1959		1958		1957		1956		1955	
	Metric Tons	Value \$1,000	Metric Tons	Value \$1,000	Metric Tons	Value \$1,000	Metric Tons	Value \$1,000	Metric Tons	Value \$1,000
United States	3,136	517	1,583	271	443	70	99	15	110	10
Canada	-	-	-	-	828	155	404	78	1,805	359
Denmark	-	-	-	-	-	-	900	84	400	69
Sweden	-	-	-	-	-	-	500	66	-	-
Chile	-	-	452	64	97	15	-	-	-	-
Peru	602	103	401	49	380	45	-	-	-	-
Portugal	-	-	138	20	-	-	-	-	-	-
Mexico	466	75	-	-	-	-	-	-	-	-
Other 1/	-	-	-	-	25	4	5	1	20	5
Total	4,204	695	2,574	404	1,773	289	1,908	244	2,835	443

1/Includes 20 tons from Norway in 1955 and 5 tons in both 1956 and 1957, plus 21 tons from Panama in 1957.

conveyor mechanism under indirect heat. Half way through the conveyor the drying product will be given one turn. On completion of drying, which will take about one hour, the product will be double milled and sacked.

According to the designer the drying mechanism will serve a dual purpose. In addition to drying meal it will be used to precook sardines prior to canning. The immediate use, however, will be for drying fish for meal from "rabo amarillo" and machuelo. The canning machinery will be installed at a later date.

The local Venezuelan market now consumes about 7,000 metric tons of fish meal a year. At present fish meal is sold at a fixed price per ton irrespective of protein content. The same price is paid for 50 percent protein fish meal as for 70 percent. It is expected, however, that this procedure will change in the near future and prices will be based on actual protein value. Current annual production of meal is 4,000 to 5,000 tons below annual consumption. Government policy is protectionist and is encouraging meal production.

The Government is sponsoring programs for increased egg, hog, and cattle production which should, as these programs develop, stimulate increased fish-meal consumption.

Waste from sardine and tuna canneries has been able to produce less than half the fish-meal requirements of the country. There is little likelihood that there will be any great increase in fish-meal production from these sources in the immediate future, and it is unlikely that the use of whole sardines for making fish meal will be permitted.

However, there appear to be relatively large resources of "rabo amarillo" and "machuelo" which probably can supply the local fish-meal demand for the immediate future. The plants, in their initial experiments with "rabo amarillo," encountered technical difficulties in processing this fish when it was not extremely fresh. It is believed, with proper technical direction, that these difficulties can be overcome. Consequently it is anticipated that within the next few years Venezuela probably will be self sufficient with respect to fish meal.

It is unlikely, owing to fishing methods and production costs, that Venezuela will be in a position to export fish meal in the foreseeable future. (American Embassy, Mexico, D.F., July 29, 1960.)



ALGAE BANK GETS FUNDS FOR NEXT FIVE YEARS

An algae "bank" of more than 800 strains, studied as a possible food to meet the threat of overpopulation, will be supported by a grant of \$34,600 for the next five years from the National Science Foundation. The research is being carried on at Indiana University.

The algae are grown in glass tubes in a constant temperature under continuous fluorescent lighting. They are studied as a food and used in genetics research. They may possibly be grown on future space flights as food for space travelers. Science News Letter, April 2, 1960.



FEDERAL ACTIONS



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

EFFECTIVE DATE OF FOOD ADDITIVES STATUTE IS EXTENDED FOR ADDITIONAL ITEMS:

The Commissioner of Food and Drugs, under the Federal Food, Drug, and Cosmetic Act, has designated (Federal Register, August 4, 1960) additional food additives which can be used in foods either directly or indirectly under certain specified conditions for a period of 1 year from March 6, 1960, or until regulations have been issued establishing or denying tolerances or exemptions. On the basis of data supplied, the Commissioner has found that no undue risk to the public health is involved and that conditions exist that make necessary the prescribing of an additional period of time for obtaining tolerances or denials of tolerances or for granting exemption from tolerances.

One list contains 18 and a second list an additional 18 items (including sodium nitrate or a combination of sodium nitrate and sodium nitrite) as direct additives to food; a third list contains about 125 items as indirect additives to food. In many instances the tolerance limit is given, where applicable, and the specified uses or restrictions are specified.

Also, the Commissioner proposes to add about 39 nutrients incorporated in dietary food supplements.

PROPOSAL TO ADD CERTAIN SYNTHETIC FLAVORINGS TO SUBSTANCES RECOGNIZED AS SAFE:

The Commissioner of Food and Drugs, under the Federal Food, Drug, and Cosmetic Act, proposed to amend the food additives regulations to exempt certain synthetic fla-

vorings substances used as additives from the requirement of tolerances by adding them to the list of substances generally recognized as safe (Federal Register, August 12, 1960.)

The list of synthetic flavorings contains about 27 items.

EFFECTIVE DATE OF FOOD ADDITIVES STATUTE EXTENDED FOR SYNTHETIC FLAVORINGS:

The Commissioner of Food and Drugs, under the Federal Food, Drug, and Cosmetic Act, has designated (Federal Register, August 13, 1960) synthetic flavoring substances and adjuncts which can be used in foods either directly or indirectly under certain specified conditions for a period of 1 year from March 1, 1960, or until regulations have been issued establishing or denying tolerances or exemptions. On the basis of data supplied, the Commissioner has found that no undue risk to the public health is involved and that conditions exist that make necessary the prescribing of an additional period of time for obtaining tolerances or denials of tolerances or for granting exemption from tolerances.

The list contains hundreds of synthetic flavoring substances and adjuncts used as direct additives to food.



Department of the Interior

FISH AND WILDLIFE SERVICE

FEDERAL CODE OF REGULATIONS FOR FISH AND WILDLIFE REVISED:

A revision of Title 50, Code of Federal Regulations, which contains all regulations pertaining to fish and wildlife as administered by the U. S. Fish and Wildlife Service and its two bureaus--Bureau of Commercial Fisheries, and Bureau of Sport Fisheries and Wildlife--appeared in the September 1, 1960, Part II issue of the Federal Register.

Chapter I covers the regulations of the Bureau of Sport Fisheries and Wildlife and includes the following subchapters: general provisions; hunting and possession of wildlife; the National Wildlife Refuge System; management of Wildlife Research Areas; management of Fisheries Conservation Areas; and Federal Aid to States in fish and wildlife restoration.

Chapter II covers the regulations of the Bureau of Commercial Fisheries and includes the following subchapters: general provisions; North Pacific commercial fisheries; aquatic mammals other than whales; whaling; Northwest Atlantic commercial fisheries; aid to fisheries; processed fishery products, processed products thereof, and certain other processed food products.

Chapter III covers international regulatory agencies (fishing and whaling) and includes the following subchapters: International Pacific Halibut Commission; International Whaling Commission.

* * * * *

UNITED STATES WHALING REGULATIONS BROUGHT UP TO DATE:

The provisions of the whaling regulations, as originally embodied in the schedule annexed to the International Convention for the Regulation of Whaling signed at Washington, December 2, 1946, by the United States and certain other Governments have been amended several times by the International Whaling Commission. The last amendments were made in October 1959 and January 1960. Therefore, the United States whaling regulations, as last amended on October 5, 1959, and January 3, 1960, have been edited to conform in numbering, internal references, and similar items to regulations of the Administrative Committee of the Federal Register, but no changes have been made in the substantive provisions. The regulations are applicable to nationals and whaling enterprises of the United States.

The regulations as amended and republished appeared in the August 17, 1960, Federal Register. The regulations cover inspection; killing of gray or white whales prohibited; killing of calves or suckling whales prohibited; operation of factoryships limited; closed area for factoryships in Antarctic; limitations on the taking of humpback whales; closed seasons for pelagic whaling for baleen and sperm whales; minimum size limits; closed seasons for land stations; use of factoryships in waters other than south of 40° S. latitude; limitations

on processing of whales; prompt processing required; remuneration of employees; submission of laws and regulations; submission of statistical data; factoryship operations within territorial waters; and definitions. Note: See *Commercial Fisheries Review*, June 1960 p. 68, May (1960) p. 71.

* * * * *

BUREAU OF COMMERCIAL FISHERIES

QUALITY STANDARDS ESTABLISHED FOR FROZEN SHRIMP:

Voluntary standards for the production of high-quality, frozen, raw, headless shrimp have been approved, the Department of the Interior announced August 11, 1960. The standards were published in the Federal Register of August 11, 1960, and became effective September 10, 1960. The notice of intention to establish standards was carried in the Federal Register on May 7, 1960.

The standards were developed by the U. S. Bureau of Commercial Fisheries after months of research. Well-advertised public meetings in Los Angeles, New Orleans, Chicago, Jacksonville, and Corpus Christi, were attended by interested industry groups, consumer representatives, and representatives of the National Fisheries Institute. Suggestions made as a result of these and other contacts were all given full consideration and many of them were adopted.

Shrimp is the most valuable fishery resource of the United States. In 1959, the United States catch amounted to about 142 million pounds, with the heads removed. More than 80 percent of the catch was landed at Gulf of Mexico ports from Texas to Florida, about 11 percent at South Atlantic ports, and about eight percent at Pacific Coast ports. Texas was the biggest producing state, followed by Louisiana and Florida. The shrimp catch in 1959 was valued at nearly 60 million dollars to the fishermen.

Acceptance of the quality standards by individual firms is entirely voluntary. Firms with USDI continuous inspection service will have the right to so inform the consumer by appropriate markings on the product package.

Quality standards have already been established for frozen fish sticks, raw frozen breaded shrimp, frozen raw halibut steaks, frozen haddock fillets, cod fillets, rawbreaded fish portions, frozen fish blocks, and frozen salmon steaks.

The U. S. Bureau of Commercial Fisheries also announces that 34 processing firms now have the right to use the Department of the Interior shields of quality.

Title 50—WILDLIFE

Chapter I—Fish and Wildlife Service, Department of the Interior

SUBCHAPTER K—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS

PART 182—UNITED STATES STANDARDS FOR GRADES OF FROZEN RAW HEADLESS SHRIMP¹

On page 4114 of the FEDERAL REGISTER of May 7, 1960, there was published a notice and text of a proposed new Part 182 of Title 50, Code of Federal Regulations. The purpose of the new part is to issue United States Standards for Grades of Frozen Raw Headless Shrimp under the authority transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e).

Interested persons were given until June 6, 1960, to submit written comments, suggestions or objections with respect to the proposed new part. Comments were received and considered and the proposed new part is hereby adopted with minor changes and is set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Dated: August 5, 1960.

FRED G. AANDAHL,
Acting Secretary of the Interior.

PRODUCT DESCRIPTION, GRADES AND SIZES

- Sec. 182.1 Product description.
- 182.2 Grades of frozen raw headless shrimp.
- 182.3 Sizes of frozen raw headless shrimp.

FACTORS OF QUALITY AND GRADE

182.11 Ascertaining the grade.

DEFINITIONS AND METHODS OF ANALYSIS

- 182.21 Definitions and methods of analysis.
- LOT CERTIFICATION TOLERANCES
- 182.25 Tolerances for certification of officially drawn samples.

SCORE SHEET

- 182.31 Score sheet for frozen raw headless shrimp.

AUTHORITY: §§ 182.1 to 182.31 issued under sec. 6(a), Fish and Wildlife Act of August 8, 1956 (16 U.S.C. 742e), and sec. 205(b), Agricultural Marketing Act of August 14, 1946, as amended (7 U.S.C. 1624(b)).

PRODUCT DESCRIPTION, GRADES AND SIZES

§ 182.1 Product description.

Frozen raw headless shrimp are clean, wholesome, headless, shell-on shrimp of the regular commercial species. They are sorted for size, packed, and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product.

§ 182.2 Grades of frozen raw headless shrimp.

(a) "U.S. Grade A" or "U.S. Fancy" is the quality of frozen raw headless shrimp

¹ Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

of a single commercial count that possess a good flavor and odor, that are of a reasonably uniform color, and that for those factors which are rated in accordance with the scoring system outlined in the following sections, the total score is not less than 90 points.

(b) "U.S. Grade B" or "U.S. Good" is the quality of frozen raw headless shrimp of a single commercial count that possess at least reasonably good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections, the total score is not less than 80 points.

(c) "U.S. Grade C" or "U.S. Commercial" is the quality of frozen raw headless shrimp of a single commercial count that possess at least reasonably good flavor and odor, and that for those factors which are rated in accordance with the scoring system outlined in the following sections, the total score is not less than 70 points.

(d) "Substandard" is the quality of frozen raw headless shrimp that fail to meet the requirements of "U.S. Grade C" or "U.S. Commercial."

§ 182.3 Sizes of frozen raw headless shrimp.

The average weight and number of shrimp per pound (count) of frozen raw headless shrimp are not factors of quality in determining the grade of the product. However the degree of conformity of the weights of the individual shrimp to the average weight of shrimp in the sample is rated since it is a factor affecting the utility of the product. Descriptive size names are not recommended. The commercial count (number per pound) and descriptive size names, if used, shall conform to one of the following categories:

Commercial count Number of shrimp per pound	Number of shrimp per pound (average)		Descriptive size name
	Over—	Not over—	
Under 10.....	5.9	9.9	Extra colossal.
10-15.....	10.0	15.0	Colossal.
16-20.....	15.0	20.0	Extra jumbo.
21-25.....	20.0	25.0	Jumbo.
26-30.....	25.0	30.0	Extra large.
31-35.....	30.0	35.0	Large.
36-40.....	35.0	42.0	Medium large.
43-50.....	42.0	50.0	Medium.
51-60.....	50.0	60.0	Small.
61-70.....	60.0	70.0	Extra small.
Over 70.....	70.0	.....	Shrimp.

FACTORS OF QUALITY AND GRADE

§ 182.11 Ascertaining the grade.

(a) *General.* In addition to considering other requirements outlined in the standards, the grade is ascertained by observing the product in the frozen, thawed, and cooked states and is evaluated by considering the following:

(1) *Factors rated by score points.* The quality of the product with respect to factors scored is expressed numerically. Factors rated by score points are: dehydration; deterioration; black spot on shell or loose membrane only; black spot on meat; broken, damaged and pieces of shrimp; legs, loose shell, and flippers; heads an unacceptable shrimp; extraneous materials; uniformity of size; and the texture of the cooked product.

Cumulative point deductions from the maximum possible score of 100 are assessed for variations of quality for each factor in accordance with the schedule in Table I. The minimum score is 0.

(2) *Factor not rated by score points.* The factor of "flavor and odor" is evaluated organoleptically after the product has been cooked in a suitable manner, and is defined as follows:

(i) *Good flavor and odor.* "Good flavor and odor" (essential requirement for a Grade A product) means that the product has the good flavor and odor characteristic of freshly caught, chilled shrimp and is free from off-flavors and off-odors of any kind. The presence of iodoforn-like flavor and odor is not to be construed as off-flavor and off-odor.

(ii) *Reasonably good flavor and odor.* "Reasonably good flavor and odor" (minimum requirement of Grade B and Grade C products) means that the product may be somewhat lacking in the good flavor and odor characteristic of freshly caught, chilled shrimp but is free from objectionable off-flavors and objectionable off-odors of any kind.

DEFINITIONS AND METHODS OF ANALYSIS

§ 182.21 Definitions and methods of analysis.

(a) "Count," or number of shrimp per pound, is determined by dividing the number of shrimp in the package by the actual net weight in pounds of the shrimp.

(b) "Net weight" of the shrimp is determined as follows:

(1) *Equipment needed.* (i) Container, 4-gallon or more capacity;

(ii) Source of running water that can be maintained at 75-85° F; with hose of sufficient length to reach the bottom of the container;

(iii) Balance accurate to 0.01 ounce, or 0.1 gram;

(iv) U.S. standard wire sieve, ASTM No. 20, 12-inch diameter.

(2) *Procedure.* Place the frozen shrimp in the 4-gallon container into which fresh water of a temperature from 75° to 85° F. is introduced from the bottom at a flow of approximately six gallons per minute. After any glaze has been removed and the shrimp separate easily, empty the contents of the container through the tared sieve, spreading the shrimp out evenly. Tilt the sieve at approximately a 45-degree angle to facilitate drainage; drain the shrimp for 2 minutes; and then weigh the sieve and contents. The net weight is the weight of the sieve and contents minus the weight of the sieve.

(c) "Cooked in a suitable manner" means that a thawed sample of the product has been cooked by the following method:

Place 2 to 4 ounces of peeled deveined and rinsed shrimp in a boilable plastic bag with ½-cup of salt solution (1 teaspoon salt dissolved in 1 pint or 2 cups of water). Add a 2-ounce stainless steel weight or snap a large clip on bottom of bag. Suspend the bag in a kettle of boiling water and return the water to a boil as rapidly as possible. (More than one sample may be cooked at a time, as long as the water will return to a boil within 2 minutes). After the water is boiling, cook according to the following timetable:

Count of shrimp—Number per pound	Cooking time (minutes)
Up to 15.....	12
16 to 35.....	9
Over 35.....	6

Remove from bag, drain, and cool to approximately room temperature (do not refrigerate) for evaluation of flavor and odor.

(d) "Dehydration" refers to the occurrence of a whitish area on the exposed ends of the shrimp, due to the drying of the affected area, and to a generally desiccated appearance of the meat after the shell is removed.

(e) "Deterioration" refers to any detectable change from the normal good quality of freshly caught shrimp. It is evaluated by noting deviations of the odor of the thawed product from the normal odor of freshly caught shrimp.

(1) "Slight deterioration" means that the shrimp lack the pleasant odor characteristic of freshly caught shrimp.

(2) "Moderate deterioration" means that the shrimp have slight off-odors.

(3) "Marked deterioration" means that the shrimp have definite off-odors, but are not spoiled.

(4) "Excessive deterioration" means that the shrimp have a definite odor of spoilage. Deductions in this category are made for individual shrimp which are affected.

(f) "Black spot on the shell or loose membrane only" refers to blackened areas at least moderately affecting the appearance of the shrimp.

(1) "Moderately affecting" means that the black spot which occurs at the shell joints extends at least one-third of the circumference of the shrimp at the particular location at which it occurs, and black spot which occurs as a circular area exceeds one-eighth inch in diameter for 31/35 count shrimp or is proportionately larger or smaller for respectively larger or smaller shrimp.

(g) "Black spot on the meat" refers to any darkened area that is present on the shrimp flesh.

(h) "Broken" refers to a shrimp having a break in the flesh greater than one-third of the thickness of the shrimp at the particular location at which it occurs.

(i) "Damaged" refers to a shrimp that is crushed or mutilated so as to materially affect its appearance.

(j) "Pieces" refers to any portion of shrimp that contains less than five segments.

(k) "Legs" refers to walking legs only, not swimmerets, or to portions of the head (cephalothorax) with legs and which may be either loose or attached to a shrimp.

(l) "Loose shell" refers to any piece of shell which is completely detached from the shrimp, except paper-thin shell from soft-shelled shrimp.

(m) "Flipper" refers to a tail fin, sometimes including the last shell segment but containing no meat.

(n) "Head" means any portion of head (cephalothorax) large enough to contain an eye and which may be either loose or attached to a shrimp.

(o) "Unacceptable shrimp" refers to abnormal or diseased shrimp.

(p) "Extraneous material" means any material in the package which is not shrimp material.

(q) "Uniformity of size" is evaluated by computing the actual count per pound of the shrimp in the sample, and then determining, by weighing individual shrimp, the number of shrimp that are slightly large, slightly small, exceedingly large, or exceedingly small for that particular count per pound.

(1) "Slightly large" means that a shrimp is more than 25 percent, but not more than 35 percent larger, by weight, than a shrimp of the actual count per pound.

(2) "Exceedingly large" means that a shrimp is more than 35 percent larger, by weight, than a shrimp of the actual count per pound.

(3) "Slightly small" means that a shrimp is more than 25 percent, but not more than 35 percent smaller, by weight, than a shrimp of the actual count per pound.

(4) "Exceedingly small" means that a shrimp is more than 35 percent smaller, by weight, than a shrimp of the actual count per pound. For use in computing the uniformity of size factor, weights of individual shrimp are given in Table II.

(r) "Texture" defect refers to an undesirable toughness and/or dryness and/or mushiness of the shrimp examined in the cooked state.

LOT CERTIFICATION TOLERANCES

§ 182.25 Tolerances for certification of officially drawn samples.

The sample rate and grades of specific lots shall be certified in accordance with Part 170 of this chapter (regulations governing processed fishery products, 23 F.R. 5064, July 3, 1958).

With respect to conformance with the declared commercial count, the lot shall be considered to be of the declared count if the number of deviant units in the sample does not exceed the acceptance number prescribed for the sample size in Part 170 of this chapter. If a lot fails to meet the requirements of any specific commercial count, it shall be marked a mixed lot and shall not be graded.

SCORE SHEET

§ 182.31 Score sheet for frozen raw headless shrimp.

GENERAL

Label.....	.....
Size and kind of container.....	.....
Container mark or identification.....	.....
Size of lot.....	.....
Number of samples.....	.....
Declared count per pound.....	.....
Actual net weight (ounces).....	.....
Actual count per pound.....	.....
Descriptive size name.....	.....

Scored factors (table 1)	Deductions
Frozen and thawed:	
1. Dehydration.....	
Thawed:	
2. Deterioration.....	
3. Black spot on shell or loose membrane only.....	
4. Broken, damaged, and pieces.....	
5. Legs, loose shell, and flippers.....	
6. Heads and unacceptable shrimp.....	
7. Extraneous material.....	
8. Uniformity of size.....	
Cooked:	
9. Texture.....	
Total deductions.....	
Rating for scored factors (100 minus total deductions).....	
Flavor and odor.....	
Final grade.....	

TABLE I—SCHEDULE OF DEDUCTIONS FOR FACTORS RATED BY SCORE POINTS¹

State	Factor	Description of quality variation	Deduct	
Frozen and thawed	Dehydration.....	Dehydrated—exposed ends		
		Destication of meat		
	Frozen state	Up to 5 percent.....	None.....	0
		5.1-15.0 percent.....	Slight.....	3
	Thawed state	Up to 5.0 percent on small.....	Moderate.....	6
		5.1-15.0 percent.....	Marked.....	11
	(Percent by count of total sample.) Apply the one highest deduction only.			
	Deterioration.....	Off-odor, overall sample:		
		Slight.....		2
		Moderate.....		5
Marked.....			21	
Any excessive, each 1 percent or fraction (percent by count).....			5	
Thawed	Black spot on shell or loose membrane only.....	Shell affected, but not meat:		
		Not over 5 percent.....	0	
	Each additional 5 percent, or fraction (percent by count).....	1		
	Black spot on meat.....	None.....	0	
		Not over 3 percent.....	1	
	3.1-5.0 percent.....	2		
	Each additional 5 percent, or fraction (percent by count).....	2		
	Broken, damaged, and pieces.....	Not over 1 percent.....	0	
		1.1-3.0 percent.....	2	
	Each additional 3 percent, or fraction (percent by weight).....	2		
Legs, loose shell, and flippers.....	Not over 3 percent.....	0		
	Each additional 3 percent, or fraction (percent by count).....	2		
Heads and unacceptable shrimp.....	Not over 1 percent.....	2		
	Each additional 1 percent, or fraction (percent by count).....	3		
Extraneous material.....	1 piece.....	1		
	2 pieces.....	2		
Over 2 pieces.....	4			
Uniformity of size.....	Slightly large and slightly small: Each 3 percent, or fraction.....	1		
	Exceedingly large and exceeding small: Each 3 percent, or fraction (percent by count—based on actual count per pound of sample).....	2		
Cooked	Texture.....	Tough, dry, or mushy:		
		Slight.....	2	
		Moderate.....	4	
		Excessive.....	11	

¹ This schedule of point deductions is based on the examination of sample units composed of: (a) the contents of an entire package or (b) sufficient packages to provide a sample unit of 2 pounds or more, declared net weight.

RULES AND REGULATIONS

TABLE II—WEIGHTS OF NON-UNIFORM SHRIMP

(Ounces)

Count per pound	Exceedingly large	Slightly large	Slightly small	Exceedingly small
8.....	Over—2.70	Over—2.50	Under—1.50	Under—1.30
9.....	2.40	2.22	1.33	1.16
10.....	2.16	2.00	1.23	1.04
11.....	1.96	1.82	1.09	0.94
12.....	1.80	1.67	1.00	.87
13.....	1.66	1.54	0.92	.80
14.....	1.54	1.43	.86	.74
15.....	1.44	1.33	.80	.69
16.....	1.35	1.25	.75	.65
17.....	1.27	1.18	.71	.61
18.....	1.19	1.11	.67	.58
19.....	1.14	1.05	.63	.55
20.....	1.08	1.00	.60	.52
21.....	1.03	0.95	.57	.50
22.....	0.98	.91	.54	.47
23.....	.94	.87	.52	.45
24.....	.90	.83	.50	.43
25.....	.86	.80	.48	.42
26.....	.83	.77	.46	.40
27.....	.80	.74	.44	.38
28.....	.77	.71	.43	.37
29.....	.74	.69	.41	.36
30.....	.72	.67	.40	.35
31.....	.70	.64	.39	.34
32.....	.67	.62	.38	.32
33.....	.65	.61	.36	.32
34.....	.64	.59	.35	.30
35.....	.62	.57	.34	.30
36.....	.60	.56	.33	.29
37.....	.58	.54	.32	.28
38.....	.57	.53	.32	.27
39.....	.55	.51	.31	.27
40.....	.54	.50	.30	.26
41.....	.53	.49	.29	.25
42.....	.51	.48	.29	.25
43.....	.50	.47	.28	.24
44.....	.49	.46	.27	.24
45.....	.48	.44	.27	.23
46.....	.47	.44	.26	.23
47.....	.46	.42	.26	.22
48.....	.45	.42	.25	.22
49.....	.44	.41	.24	.21
50.....	.43	.40	.24	.21
51.....	.42	.39	.24	.20
52.....	.42	.38	.23	.20
53.....	.41	.38	.23	.20
54.....	.40	.37	.22	.19
55.....	.39	.36	.22	.19
56.....	.39	.36	.21	.18
57.....	.38	.35	.21	.18
58.....	.37	.34	.21	.18
59.....	.37	.34	.20	.18
60.....	.36	.33	.20	.17
61.....	.35	.33	.20	.17
62.....	.35	.32	.19	.17
63.....	.34	.32	.19	.16
64.....	.34	.31	.19	.16
65.....	.33	.31	.18	.16
66.....	.33	.30	.18	.16
67.....	.32	.30	.18	.16
68.....	.32	.29	.18	.16
69.....	.31	.29	.17	.15
70.....	.31	.28	.17	.15
71.....	.30	.28	.17	.15

ALTERNATE TABLE II—WEIGHTS OF NON-UNIFORM SHRIMP

(Grams)

Count per pound	Exceedingly large	Slightly large	Slightly small	Exceedingly small
8.....	Over—73.5	Over—70.7	Under—42.3	Under—38.3
9.....	68.0	62.9	37.7	32.9
10.....	61.2	56.7	34.0	29.5
11.....	55.6	51.6	30.9	26.6
12.....	51.0	47.3	28.4	24.7
13.....	47.1	43.7	26.1	22.8
14.....	43.7	40.5	24.4	21.0
15.....	40.8	37.7	22.7	19.6
16.....	38.3	35.4	21.3	18.4
17.....	36.0	33.4	20.1	17.3
18.....	33.7	31.5	19.0	16.4
19.....	32.3	29.8	17.9	15.6
20.....	30.6	28.4	17.0	14.7
21.....	29.2	26.9	16.2	14.2
22.....	27.8	25.8	15.3	13.3
23.....	26.6	24.7	14.7	12.8
24.....	25.5	23.5	14.2	12.2
25.....	24.4	22.7	13.6	11.9
26.....	23.5	21.8	13.0	11.3
27.....	22.7	21.0	12.5	10.8
28.....	21.8	20.1	12.0	10.5
29.....	21.0	19.6	11.6	10.2
30.....	20.4	19.0	11.3	9.9
31.....	19.8	18.1	11.0	9.6
32.....	19.6	17.6	10.8	9.2
33.....	18.4	17.3	10.2	8.9
34.....	18.1	16.7	9.9	8.6
35.....	17.6	16.2	9.6	8.4
36.....	17.0	15.9	9.4	8.2
37.....	16.4	15.3	9.1	7.9
38.....	16.2	15.0	9.0	7.7
39.....	15.6	14.5	8.8	7.6
40.....	15.3	14.2	8.5	7.4
41.....	15.0	13.9	8.3	7.2
42.....	14.4	13.6	8.1	7.0
43.....	14.2	13.3	7.9	6.9
44.....	13.9	13.0	7.7	6.7
45.....	13.6	12.5	7.6	6.6
46.....	13.3	12.3	7.4	6.4
47.....	13.0	12.0	7.2	6.3
48.....	12.8	11.8	7.1	6.2
49.....	12.4	11.6	6.9	6.0
50.....	12.2	11.3	6.8	5.9
51.....	11.9	11.0	6.8	5.7
52.....	11.9	10.9	6.5	6.7
53.....	11.6	10.8	6.5	5.7
54.....	11.3	10.5	6.2	5.4
55.....	11.1	10.2	6.2	5.4
56.....	11.1	10.2	6.0	5.1
57.....	10.8	9.9	6.0	5.1
58.....	10.5	9.6	6.0	5.1
59.....	10.6	9.6	5.7	5.1
60.....	10.2	9.4	5.7	4.8
61.....	9.9	9.4	5.7	4.8
62.....	9.9	9.1	5.4	4.8
63.....	9.6	9.1	5.4	4.6
64.....	9.6	8.8	5.4	4.6
65.....	9.4	8.8	5.1	4.5
66.....	9.4	8.5	5.1	4.5
67.....	9.1	8.5	5.1	4.5
68.....	9.1	8.2	5.1	4.3
69.....	8.8	8.2	4.8	4.3
70.....	8.9	7.9	4.8	4.3
71.....	8.5	7.9	4.8	4.3

Notes: Also see Commercial Fisheries Review, July (1960) p. 82.

PROHIBITION EXTENDED ON HIGH-SEAS NET FISHING FOR SALMON IN NORTH PACIFIC:

Salmon fishing with nets will be prohibited to United States nationals on the high seas of the entire North Pacific Ocean and the Bering Sea north of 48° 30' N. latitude as the result of regulations issued in the Federal Register of August 16, 1960.

The notice of intention was carried in the Federal Register of June 9, 1960. Although

interested persons were given 30 days in which to submit their written comments, suggestions, or objections, none were received.

This revision of prior regulations extends the prohibited salmon net-fishing area to the west of longitude 175° W. where it has not previously been in effect.

The new regulation, which continues a similar exception in the previous regulation, does not apply to fishing for sockeye salmon

or pink salmon south of latitude 49° N. because control of those species is covered from latitude 49° to 48° by the International Sockeye Salmon Commission.

The revised regulation conforms with a request of Alaska's legislature which, in its Second Session, asked for the stoppage of all salmon fishing by nets on the high seas of the North Pacific Ocean and the Bering Sea.

The regulation as it appeared in the Federal Register of August 16, 1960, follows:

SUBCHAPTER F—NORTH PACIFIC COMMERCIAL FISHERIES

PART 130—NORTH PACIFIC AREA

Salmon Fisheries

On page 5153 of the FEDERAL REGISTER of June 9, 1960, there was published a notice of intention to amend Part 130 of Title 50, Code of Federal Regulations. The purpose of the amendment is to extend the boundaries of the area on the high seas of the North Pacific Ocean where it is prohibited to fish for, or take, salmon with any net; to define the term North Pacific Area; and to retitile Subchapter F.

Interested persons were given 30 days within which to submit their written comments, suggestions or objections with respect to the proposed amendment. No written comments, suggestions or objections have been received and the proposed amendment is hereby adopted without change and is set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

The heading for Subchapter F of Title 50, Code of Federal Regulations, is amended to read: Subchapter F—North Pacific Commercial Fisheries.

Part 130 is amended to read as follows:

Sec.
130.1. Definition.
130.10 Salmon fishing prohibited; exception.

Authority: §§ 130.1 and 130.10 issued under sec. 1, 59 Stat. 936, as amended; 16 U.S.C. 1021 et seq.

§ 130.1 Definition.

For the purpose of the regulations of this part the North Pacific area is defined to include all waters of the North Pacific Ocean and Bering Sea north of 48 degrees 30 minutes north latitude, exclusive of waters adjacent to Alaska north and west of the International Boundary at Dixon Entrance which extend three miles seaward (a) from the coast, (b) from lines extending from headland to headland across all bays, inlets, straits, passes, sounds and entrances, and (c) from any island or groups of islands, including the islands of the Alexander Archipelago, and the waters between such groups of islands and the mainland.

§ 130.10 Salmon fishing prohibited, exception.

No person or fishing vessel subject to the jurisdiction of the United States shall fish for or take salmon with any net in the North Pacific area, as defined in this part: *Provided*, That this shall not apply to fishing for sockeye salmon or pink salmon south of latitude 49 degrees north.

Dated: August 9, 1960.

FRED A. SEATON,
Secretary of the Interior.

Note: Also see Commercial Fisheries Review, August 1960 p. 77.

* * * * *

UNITED STATES AID IN FISHING VESSEL CONSTRUCTION NOT INCLUDED UNDER MORTGAGE INSURANCE PLAN:

Federal financial assistance given toward the construction of a fishing vessel will not be included in arriving at the "actual cost" of the vessel for mortgage insurance purposes if an amended regulation proposed by the Department of the Interior becomes effective. The proposed amendment was carried in the Federal Register of August 31, 1960. Final action was expected to follow the usual 30-day period granted for comment, suggestions, and objections.

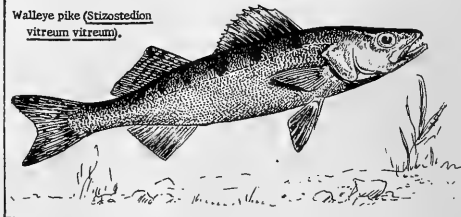
Two laws relative to fishing vessels, recently passed by the Congress and signed by the President, are being activated by the U. S. Bureau of Commercial Fisheries. One of these provides a program of financial assistance to vessels of American registry being constructed in this country. This is to offset the cheaper construction costs abroad and to provide auxiliary vessels in times of national emergency. United States fishermen are not permitted by law to avail themselves of the lower foreign construction costs. The act permits a Federal grant of not more than one-third of the construction cost under certain restricted conditions. An annual authorization of \$2,500,000 is provided, but for the fiscal year ending June 30, 1961, only \$750,000 was appropriated by Congress.

The other law provides for a mortgage insurance program for fishing vessels. Under this legislation, the Department, through the U. S. Bureau of Commercial Fisheries, may guarantee a mortgage up to 75 percent of the "actual cost" of the vessel. The amended regulation specifies that any Federal financial aid given toward the construction of a vessel shall not be included in determining the "actual cost" of the vessel as far as mortgage insurance is concerned.

BUREAU OF INDIAN AFFAIRS

COMMERCIAL FISHING REGULATIONS FOR RED LAKE INDIAN RESERVATION REVISÉ:

A revision of the commercial fishing regulations for the Red Lake Indian Reservation, Minnesota, appeared in the Federal Register of August 16, 1960. The principal revisions



in the regulations include application of a maximum annual quota to yellow or walleye pike, the main species, rather than to all game fish; and prohibits the taking of yellow and northern pike (pickarel) during their spawning season except for propagation purposes. The remaining revisions are pri-

marily for clarification and to eliminate functions of the Red Lake Fisheries Association from the regulations. The regulations as they appeared in the Federal Register follow:

Title 25—INDIANS

**Chapter I—Bureau of Indian Affairs,
Department of the Interior**

SUBCHAPTER II—ECONOMIC ENTERPRISES

**PART 89—COMMERCIAL FISHING ON
RED LAKE INDIAN RESERVATION**

On page 4760 of the Federal Register of May 28, 1960, there was published a Notice of Intention to amend Part 89 of Title 25, Code of Federal Regulations. The purpose of this amendment is to revise the regulations in regard to commercial fishing on the Red Lake Indian Reservation, Minnesota. The principal revisions in the regulations include application of a maximum annual quota to walleye pike, the main species, rather than to all game fish; and prohibit the taking of walleye and northern pike during their spawning season except for propagation purposes. The remaining revisions are primarily for the purpose of clarification and to eliminate functions of the Red Lake Fisheries Association from the regulations.

Interested persons were given 30 days within which to submit written comments, suggestions or objections with respect to the proposed amendment. No comments, suggestions or objections have been received and the proposed amendment is hereby adopted without change as set forth below. This amendment shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

- Sec. 89.2 Definitions.
- 89.3 Authority to engage in commercial fishing.
- 89.4 Authority to operate.
- 89.5 Fishing.
- 89.5 Disposition of unmarketable fish.
- 89.6 Spawning season.
- 89.7 Suspension.
- 89.8 Penalty.
- 89.9 Penalties.
- 89.10 Fishing equipment limitations.
- 89.11 Royalty.
- 89.12 Authority to lease.

Authority: §§ 89.1 to 89.12 issued under 25 U.S.C. 2, U.S.C. 22.

§ 89.1 Definitions.

As used in this part:

(a) "Secretary" means the Secretary of the Interior or his authorized representative.

(b) "Council" means the General Council of the Red Lake Band of the Chippewa Indians as recognized by the Secretary of the Interior.

(c) "Association" means the Red Lake Fisheries Association, incorporated under the laws of the State of Minnesota, and whose articles of incorporation and by-laws and any amendments thereto have been approved by the Council and the Secretary of the Interior.

(d) "Member of Association" means as defined in the Association By-Laws.

(e) "Commercial Fishing" means the catching of any fish for sale directly or indirectly to others than Indians on the reservations or licensed traders on the reservation for resale to Indians.

§ 89.2 Authority to engage in commercial fishing.

No person shall engage in commercial fishing in the waters of the Red Lakes on the Red Lake Indian Reservation in the State of Minnesota except the Red Lake Fisheries Association, a corporation organized and incorporated under the laws of Minnesota, and its members, and then only in accordance with the regulations in this part. The authority hereby granted to the Association and its members to engage in commercial fishing may, at any time, be cancelled and withdrawn and these regulations may be modified and amended.

§ 89.3 Authority to operate.

The Association may conduct commercial fishing operations on the reservation under authority of its articles of incorporation and by-laws only in accordance with the regulations in this part.

§ 89.4 Fishing.

(a) Enrolled members of the Red Lake Band of Chippewa Indians may take fish at any time except as prohibited by § 89.6 from waters of the Red Lakes on the Red Lake Indian Reservation for their own use and for sale to: (1) Other Indians on the reservation and (2) licensed traders on the reservation for resale to Indians.

(b) Fish may be taken for commercial purposes only by the Association through members of the Association in residence on the reservation during the fishing season which shall be May 15 to November 15 inclusive. All fish taken for such purpose shall be marketed through the Association.

(c) In connection with commercial fishing, Association member fishermen may be assisted only by Indians who are members of the Red Lake Band.

§ 89.5 Disposition of unmarketable fish.

All unmarketable live fish taken under authority of these regulations must be returned to the water, and all unmarketable dead fish taken must be buried by the person taking the same.

§ 89.6 Spawning season.

Walleye and northern pike (or pickerel) shall not be taken during their spawning season except for propagation purposes.

§ 89.7 Suspension.

All commercial fishing operations may be suspended by order of the Secretary at any time.

§ 89.8 Penalty.

Any Indian violating the provisions of §§ 89.4 and 89.6 shall forfeit his right to take fish for any purpose for a period of three months.

§ 89.9 Quotas.

The Secretary may set such commercial quotas as he may find desirable, based on available biological and other information, on the amount of fish which may be taken under authority of the regulations in this part in any one season. Until otherwise determined by the Secretary, not more than 650,000 pounds of walleyes may be taken in any one fishing season.

§ 89.10 Fishing equipment limitations.

(a) Any variety of fish may be taken by enrolled members of the Band from any waters on the reservation by hook and line, and from Upper and Lower Red Lake by gill net or entrapment gear for noncommercial use only.

(b) For commercial fishing each member of the Association shall be limited to eight gill nets of 300 feet in length and six feet in depth, of which not to exceed six of such nets may be of nylon and other synthetic material.

(c) Gill nets for taking pike shall have a mesh of not less than 3½ inches extension measure.

(d) Gill nets for taking white fish shall have a mesh of not less than 5½ inches extension measure.

(e) Entrapment gear may only be used by members of the Association for

taking fish of any variety for commercial purposes or propagation, in accordance with such specifications and directions as the manager of the Association may provide.

(f) All nets used in Red Lake Reservation waters must be marked with appropriate tags to be furnished by the Association.

§ 89.11 Royalty.

The Association shall pay five percent of the gross receipts from the sale of fish by the Association to the designated col-

lection officer of the Bureau of Indian Affairs, which shall be deposited to the credit of the Band in the Treasury of the United States.

§ 89.12 Authority to lease.

The Band, with the approval of the Secretary, may execute a lease or permit on its fisheries plant and hatchery at Redby, Minnesota, to the Association.

FRED A. SEATON,
Secretary of the Interior.

AUGUST 9, 1960.

Note: Also see *Commercial Fisheries Review*, August 1960 p. 78.



Department of Labor

WAGE AND HOUR DIVISION

**INDUSTRY COMMITTEE TO REVIEW
WAGE RATES IN PUERTO RICO FOR
FISH CANNING INDUSTRY:**

The U. S. Department of Labor appointed Industry Committee No. 49-A to recommend hourly wage rates for the Food and Related Industry in Puerto Rico. The tuna-canning industry in Puerto Rico has a minimum rate of 85 cents an hour. This rate has been in effect since November 17, 1958, The Fair Labor Standards Act authorizes special industry committees to recommend minimum hourly wage rates for Puerto Rican industries operating at or below the \$1.00 an hour statutory minimum that applies on the mainland.



In order to attain the prescribed statutory minimum wage as rapidly as is economically feasible, the industry committee will recommend to the Administrator the highest minimum wage rate or rates which it determines will not substantially curtail employment in the industry, and will not give the industry in Puerto Rico a competitive advantage over the industry in the United States.

Industry Committee No. 49-A held its public hearing on August 15, in the offices of the U. S. Labor Department's Wage and Hour Division, San Juan, Puerto Rico.



Department of State

INTERNATIONAL COOPERATION ADMINISTRATION

FISHERIES GRANTS TO FOREIGN COUNTRIES:

A list of financial grants by the International Cooperation Administration to aid and rehabilitate the fisheries of a number of foreign countries appeared in the August 24, 1960 Congressional Record. Senator Gruening presented the list in the Senate for publication. The fishing projects financed for the 5 fiscal years since fiscal year 1955 follow:

TABLE 4.—Agriculture and natural resources

(18) Fisheries	
Fiscal year 1955	
NEAR EAST	
China: Ocean fisheries improvement.....	4304,000
Ethiopia:	
Expansion and modernization of marine fisheries.....	224,700
Expansion of inland fisheries.....	51,000
Peru: Fisheries development program (CITFA project) fisheries.....	50,000
Thailand: Fisheries.....	17,000
Development of inland fisheries.....	3,000
Development of marine fisheries.....	35,000
VIETNAM	
NEAR EAST, AFRICA, AND SOUTH ASIA	
Ethiopia: Fisheries survey.....	10,200
India: Project for modernization and expansion of marine and inland fisheries and extension fishing program.....	273,100
Liberia: Marine and fresh water fisheries.....	22,000
Philippines: Karachi fish harbor.....	364,000
Turkey: Furze seine fishing specialists.....	4,500
Peru: BOFA project fisheries.....	25,900
Total.....	7,421,961
Fiscal year 1956	
NEAR EAST	
China (Taiwan):	
Fishing fleet rehabilitation.....	5,000
Fish propagation (BEP&BR).....	8,000
Indonesia Republic: Expansion and modernization of marine and inland fisheries.....	186,494
Korea: Fishing boat construction.....	11,000,000
Lease: Inland fish culture.....	18,500
Thailand: Fisheries.....	71,000
Vietnam:	
Development of inland fisheries.....	15,200
Development of marine fisheries.....	45,000
NEAR EAST AND SOUTH ASIA	
India: Expansion and modernization of marine and inland fisheries.....	427,320
Philippines: Fisheries development: West Pakistan.....	271,274
Philippines: Fisheries development: East Pakistan.....	125,200
Turkey: Furze seine fishing specialists.....	10,000
AFRICA	
Ethiopia: Fisheries survey.....	7,000
Liberia: Marine and fresh water fisheries.....	25,200
EUROPE	
Iceland: Canning industry team for the fish industry, 54 country training.....	4,600
Yugoslavia: Fisheries.....	14,000
LATIN AMERICA	
El Salvador: Fisheries.....	15,050
Peru: Fisheries development program (CITFA project) fisheries.....	33,910
Total.....	2,355,503
Fiscal year 1957	
NEAR EAST	
China:	
Fishing fleet rehabilitation program.....	17,000
Fish propagation.....	15,000
Furze seine fishing.....	830,000
India: Expansion and modernization of marine and inland fisheries.....	149,000
Indonesia Republic: Expansion and modernization of marine and inland fisheries.....	17,000
Thailand: Fisheries.....	17,000
Development of inland fisheries.....	7,000
Development of marine fisheries.....	160,000
NEAR EAST AND SOUTH ASIA	
India: Expansion and modernization of marine and inland fisheries.....	58,000
Pakistan:	
West Pakistan fisheries development.....	45,000
East Pakistan fisheries development.....	68,000
Turkey: Furze seine fishing specialists.....	2,900

AFRICA	
Ethiopia: Fisheries development project.....	24,000
Liberia: Fresh water fisheries.....	12,000
Tunisia: Aid to commercial fisheries.....	48,000
Ovrensa territories: Somalia: Fisheries development.....	2,000
EUROPE	
Iceland:	
Canning industry team for the fish industry.....	5,000
Fish byproduct utilization.....	2,000
Herring processing study 35 country.....	1,000
LATIN AMERICA	
El Salvador: Fisheries.....	8,000
Peru: Renewable resource development.....	48,000
Total.....	8,414,000

Fiscal year 1958	
NEAR EAST	
Cambodia: Fisheries conservation.....	81,000
China (Taiwan): Fisheries development.....	31,000
Indonesia Republic: Expansion and modernization of marine and inland fisheries.....	68,000
Korea: Fisheries development.....	100,000
Vietnam: General fisheries development.....	122,000
NEAR EAST AND SOUTH ASIA	
India: Expansion and modernization of marine and inland fisheries.....	44,000
Pakistan:	
Fisheries development, West Pakistan.....	118,000
Fisheries development, East Pakistan.....	55,000
Liberia: Fresh water fisheries.....	18,000
Tunisia: Aid to commercial fisheries.....	18,000

AFRICA	
Ovrensa territories: Somalia: Fisheries.....	121,000
EUROPE	
Yugoslavia: Fisheries.....	6,000
LATIN AMERICA	
Peru: Renewable resource development (CITFA).....	20,000
ASIAN ECONOMIC DEVELOPMENT FUND	
Marine research in South China Sea and the Gulf of Thailand.....	500,000
Total.....	1,624,000

Fiscal year 1959	
NEAR EAST	
Cambodia: Fisheries conservation.....	84,000
China (Taiwan): Fisheries development (CITFA).....	18,000
Indonesia Republic: Expansion and modernization of marine and inland fisheries.....	84,000
Korea: Fisheries development.....	675,000
Vietnam: Fisheries development.....	600,000
NEAR EAST AND SOUTH ASIA	
India: Expansion and modernization of marine and inland fisheries.....	100,000
Pakistan:	
Fisheries development, West Pakistan.....	91,000
Fisheries development, East Pakistan.....	25,000
AFRICA	
Liberia: Fresh-water fisheries.....	18,000
Tunisia: Aid to commercial fisheries.....	22,000
Ovrensa Territories: Somalia: Fisheries.....	18,000
EUROPE	
Iceland: Fish control survey.....	2,000
LATIN AMERICA	
Ovrensa territories: British Guiana: Snapper fishing equipment development project.....	4,000
ASIAN ECONOMIC DEVELOPMENT FUND	
Marine development in South China Sea and Gulf of Thailand.....	400,000
Total.....	2,261,000

Treasury Department

COAST GUARD

FISHING VESSELS EXEMPTED FROM ADVANCE ARRIVAL TIME NOTICE:

The exemption of certain vessels from advance notice of time of arrival was announced by the U. S. Coast Guard in the Federal Register of July 29, 1960. Among those exempted are vessels engaged in the fisheries.

The master or agents of every foreign vessel and every documented vessel of the United States except (1) United States vessels engaged in the coastwise trade, (2) United States vessels engaged in the fisheries, or (3) United States yachts shall give at least 24 hours' advance notice of arrival to the Coast Guard Captain of the Port at every port or place where the vessel is to arrive.



Eighty-Sixth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to committees, pertinent legislative actions, hearings, and other actions by the House and Senate, as well as signature into law or other final disposition are covered.



ADJOURNMENT: The Eighty-Sixth Congress adjourned "sine die" or finally on September 1, 1960, and a considerable number of bills of interest to fisheries ended up as "unfinished business." These bills will have to be re-introduced in the 87th Congress next year if they are to receive consideration, since all bills not completed during the Second Session of this Congress are "dead" and do not carry over to the Eighty-Seventh Congress which will convene in January 1961. Also, this means that bills if and when re-introduced must go through the entire process of committee consideration, hearings, etc.

The Senate re-opened the short session of the 86th Congress on August 8 and the House reconvened on August 15, 1960. Both Houses had adjourned on July 3, 1960, for a recess of several weeks.



ALASKA FISHERIES TRANSPORT ACT EXTENSION:

S. 2659 (Bardett and Gruening), a bill to extend the period of exemption from inspection under the provisions of section 4426 of the Revised Statutes granted certain small vessels carrying freight to and from places on the inland waters of southeastern Alaska, was introduced in the House on September 9, 1959; referred to the Committee on Interstate and Foreign Commerce. Reported to the Senate March 11, 1960 (S. Rept. No. 1160). Passed Senate March 28, 1960. Referred to the House Merchant Marine and Fisheries Committee March 29, 1960. Reported to the House June 16, 1960 (H. Rept. No. 1886). Rules suspended and passed House on Union Calendar, amended, June 24, 1960. Senate asked for a conference June 29, 1960. House agreed to conference June 30, 1960. Conference report filed July 2, 1960 (S. Rept. 2086). House agreed to conference report August 24, 1960. Senate agreed to conference report August 24, 1960. Signed by the President September 2, 1960 (Public Law 86-688, 74 Stat. 735). Extends Act to December 31, 1962, and it permits certain small vessels (many of them fishing vessels) operated by cooperatives or associations to transport merchandise of members on a nonprofit basis to or from places within the inland waters of southeastern Alaska and Prince Rupert, B. C., or to or from places within said inland waters of the State of Washington. The Act originally was approved August 23, 1958 (72 Stat. 833).

FISH & WILDLIFE COOPERATIVE RESEARCH TRAINING UNITS:

On September 2, 1960, the President signed S. 1781, a bill to facilitate cooperation between the Federal Government, colleges and universities, the states, and private organizations for cooperative unit programs of research and education relating to fish and wildlife, and for other purposes (Public Law 86-686, 74 Stat. 733). Authorizes the U. S. Fish and Wildlife Service to continue to enter into cooperative agreements for conducting research, training, and demonstrational fish and wildlife resources programs.

FOREIGN TRADE EFFECTS ON AMERICAN ECONOMY:

H. Res. 629 (Levering), resolution authorizing investigation of effects of foreign trade on American economy, was introduced in the House on August 26; referred to the Committee on Rules. Because of a continuing and growing interest in certain United States industries because of GATT, because administration of Buy American Act has been detrimental to the American economy, and because there is a continuing and chronic unemployment of about 5 million workers in the United States, the resolution authorizes the chairman of the House Committee on Education and Labor to appoint a committee to start a full investigation of the operations of reciprocal trade agreements, the economic developments under the foreign and mutual aid programs, the rulings and operations of the Buy American Act and the Small Business Administration Act, to determine the effect on the economics of this country; also on the direct or indirect relationship of foreign trade on domestic employment.

H. J. Res. 808 (Robinson), joint resolution to provide for a commission to study and report on the influence of foreign trade upon business and industrial expansion in the United States; introduced in the House August 31, 1960, and referred to the Committee on Ways and Means. Similar to H. Res. 629 in purpose except that H. J. Res. 808 would provide a commission to make the study while H. Res. 629 authorizes the chairman of the House Committee on Education and Labor to appoint a committee to make the investigation.

H. J. Res. 807 (Riehlman) also introduced on August 31 is identical to H. J. Res. 808.

IMPORTED COMMODITY LABELING: H. R. 5054, a bill to amend the Tariff Act of 1930 with respect to the marking of imported articles and containers, on August 26, 1960, was sent to the President for signature. On September 8 the President vetoed the bill. In explanation of the veto, the President asserted that the bill would conflict with the reduction of unnecessary trade barriers, a major objective of United States foreign policy; also that the bill is unnecessary since the Federal Trade Commission now has the authority to require the disclosure of the country of origin of repackaged imported articles whenever the "public interest" is involved. House-passed version provided that imported articles removed from their original containers (which are required to be labeled with the country of origin), repackaged, and offered for sale in a new container, shall be marked to show the country of origin. The Senate-passed version amended the bill by providing that it would not apply in cases where the Secretary of the Treasury finds that compliance with the marking requirements would necessitate such substantial changes in customary trade practices as to cause undue hardship and that repackaging of the article in question is otherwise than for the purpose of concealing the origin of such article.

INTERNATIONAL FOOD AND RAW MATERIALS RESERVE: S. Rept. No. 1922, International Food for Peace Resolution (August 26, 1960, 86th Congress, Second Session, Report from the Committee on Foreign Relations to accompany S. Con Res. 116), 4 pp., printed. The Committee, after considering S. Con. Res. 114, S. Res. 357, S. Res. 340, and S. Res. 8, which deal with using United States surplus agricultural commodities in food for peace programs, reported S. Con. Res. 116, and original resolution, and recommended passage. Report explains purpose and background of the legislation. The appendix contains a statement from the Acting Secretary of State.

PUBLIC WORKS APPROPRIATIONS, 1961: H. Rept. No. 2181, Public Works Appropriation Bill, 1961 (August 26, 1960, 86th Congress, Second Session, Report from Conference Committee to accompany H. R. 12326), 30 pp., printed. Recommendations of the Conference Committee on the disagreements between the House and Senate versions of the legislation. Includes funds for Fish and Wildlife Service studies of effect of water projects on fish and wildlife and Columbia River fishery programs.

House on August 30 adopted the conference report on H. R. 12325, and sent the legislation to the Senate. H. R. 12326 on August 30 was cleared for President's signature when Senate adopted conference report.

House on September 1 presented to the President for signature H. R. 12326. President signed the bill September 2, 1960 (Public Law 86-700, 74 Stat. 743). Includes funds to permit detailed studies by Fish and Wildlife Service of numerous Corps of Engineers and Bureau of Reclamation projects in the United States as to their effect on fish and wildlife; funds for operation and maintenance by the U. S. Fish and Wildlife Service of the lower Columbia River fisheries development and fish sanctuary program.

SHRIMP IMPORTS: A resolution was adopted by the Senate Committee on Finance in August 1960 directing the United States Tariff Commission to make a thorough investigation of the domestic shrimp industry (including fishing, processing, and other related operations) and of imports of shrimp and shrimp products provided for in paragraph 1761 of the Tariff Act of 1930, and report to the Committee on Finance not later than March 1, 1961.

STATE DEPARTMENT APPROPRIATIONS: H. R. 11666, fiscal 1961 appropriations for the Departments of State and Justice, and the Judiciary. Signed by the President August 31, 1960 (Public Law 86-678, 74 Stat. 555). Includes funds (\$1,875,000) for the United States to meet its obligations in connection with participation in nine international fisheries commissions.

STERN RAMP TRAWLER: H. J. Res. 804 (Westland), joint resolution to authorize the Secretary of Commerce to construct a modern stern-ramp trawler to be used for research purposes and authorizing the appropriation of funds; introduced in the House August 30, 1960, and referred to the Committee on Merchant Marine and Fisheries. Similar to S. J. Res. 216 introduced in the Senate on June 30, 1960. Provides for use of the vessel in the eastern Bering Sea and other North Pacific Ocean areas and includes certain authorities for the Secretary of the Interior.

SUPPLEMENTAL APPROPRIATIONS FY 1961: Second Supplemental Appropriation Bill for 1961 (Hearings before the Committee on Appropriations, United States Senate, 86th Congress, Second Session, on H. R. 13161), 644 pp., printed. Contains statements of various agencies on requests for additional funds for fiscal year 1961, and included are statements by officials of the United States Fish and Wildlife Service for additional Bureau of Commercial Fisheries funds for fishing vessel differential construction subsidy and Eastern Pacific tuna research program; and Bureau of Sport Fisheries and Wildlife funds for emergency repairs to two wildlife refuges.

S. Rept. No. 1925, Second Supplemental Appropriation Bill, 1961 (August 27, 1960, 86th Congress, Second Session, Report from Committee on Appropriations to accompany H. R. 13161), 29 pp., printed. Contains amendments and changes to supplemental appropriations for the fiscal year ending June 30, 1961, for several Federal agencies as recommended by the Senate Committee. With reference to additional funds for the Bureau of Commercial Fisheries, the Committee recommended \$300,000 for an expansion of the tuna research programs in the Eastern Pacific instead of the House allowance of \$100,000; for the fishing vessel differential construction subsidy program, the Senate Committee recommended \$1,000,000 instead of the

House allowance of \$500,000. For the Bureau of Sport Fisheries and Wildlife, the Committee recommended \$250,000 for emergency repairs to two wildlife refuges, the same as allowed by the House. The Committee also recommended the inclusion of a provision that the Fish and Wildlife Service be authorized to acquire 20 police-type vehicles.

H. Rept. No. 2211, Second Supplemental Appropriation Bill, 1961 (August 30, 1960, 86th Congress, Second Session, Conference Report to accompany H. R. 13161), 7 pp., printed. Contains recommendations of the Committee of Conference on the amendments of the Senate to H. R. 13161, making supplemental appropriations for the fiscal year ending June 30, 1961, for several Federal agencies. Includes additional funds for the U. S. Bureau of Commercial Fisheries: The Committee agreed to appropriate \$100,000 for the Eastern Pacific tuna research program as proposed by the House instead of \$300,000 as proposed by the Senate; \$750,000 for the fishing vessel construction differential subsidy instead of \$500,000 as proposed by the House and the \$1,000,000 as proposed by the Senate.

House disagreed on August 30 to Senate amendments to H. R. 13161, agreed to conference requested by Senate on August 29, and appointed conferees. Conferees on August 30, in executive session, agreed to file a conference report on the differences between the Senate- and House-passed versions of H. R. 13161. Committee of Conference reported to House on August 30 H. R. 13161 (H. Rept. No. 2211).

House August 31 adopted conference report on H. R. 13161, and sent the legislation to the Senate. Senate August 31 adopted conference report and cleared the bill for the President. As finally agreed upon in conference, bill includes for the U. S. Bureau of Commercial Fisheries \$100,000 for Eastern Pacific tuna research and \$750,000 for the fishing vessel differential construction subsidy program. For the U. S. Bureau of Sport Fisheries \$250,000 for emergency repair work on two wildlife refuges.

Signed by the President September 8, 1960 (Public Law 86-722, 74 Stat. 821).

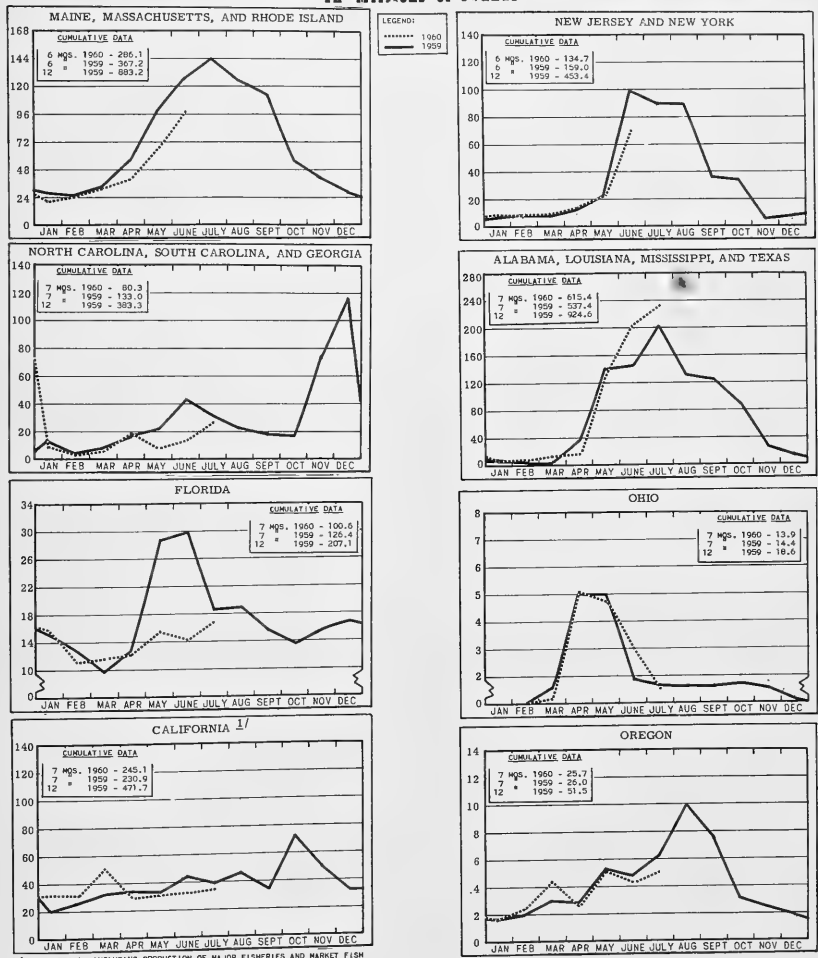
WAGES--MINIMUM HOURLY RATE INCREASE: Conferees continued, in executive session, on August 30 to resolve the differences between the Senate- and House-passed versions of H. R. 12677, proposing amendments to the Fair Labor Standards Act, which would raise the minimum wage and cover additional workers. The two versions affect the fishery exemption under the Act differently. Conferees did not reach final agreement, and recessed subject to call, but Congress adjourned and no further action was taken on the bill.



FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES

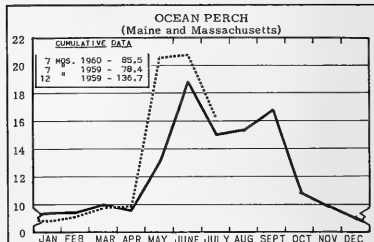
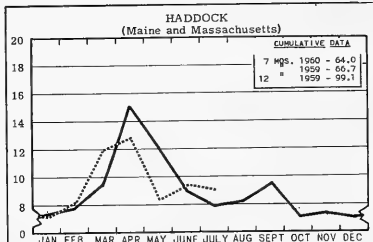
In Millions of Pounds



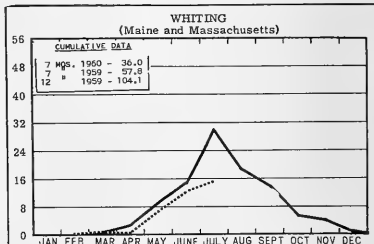
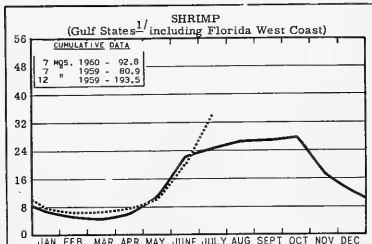
^{1/1}ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

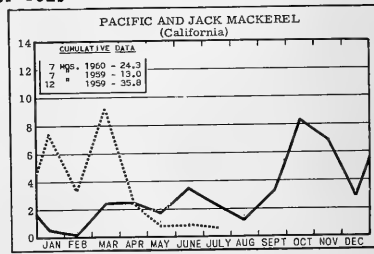
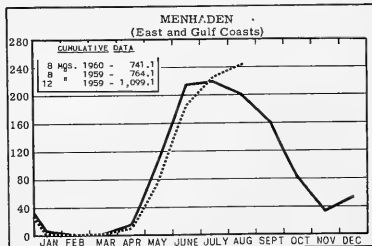


In Millions of Pounds



1/ JAN. & JULY DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

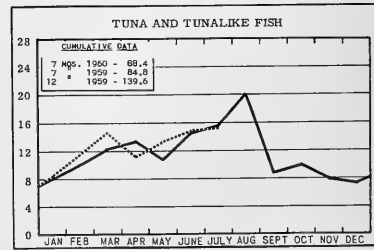
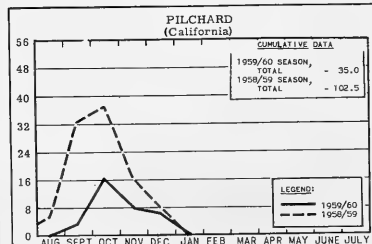
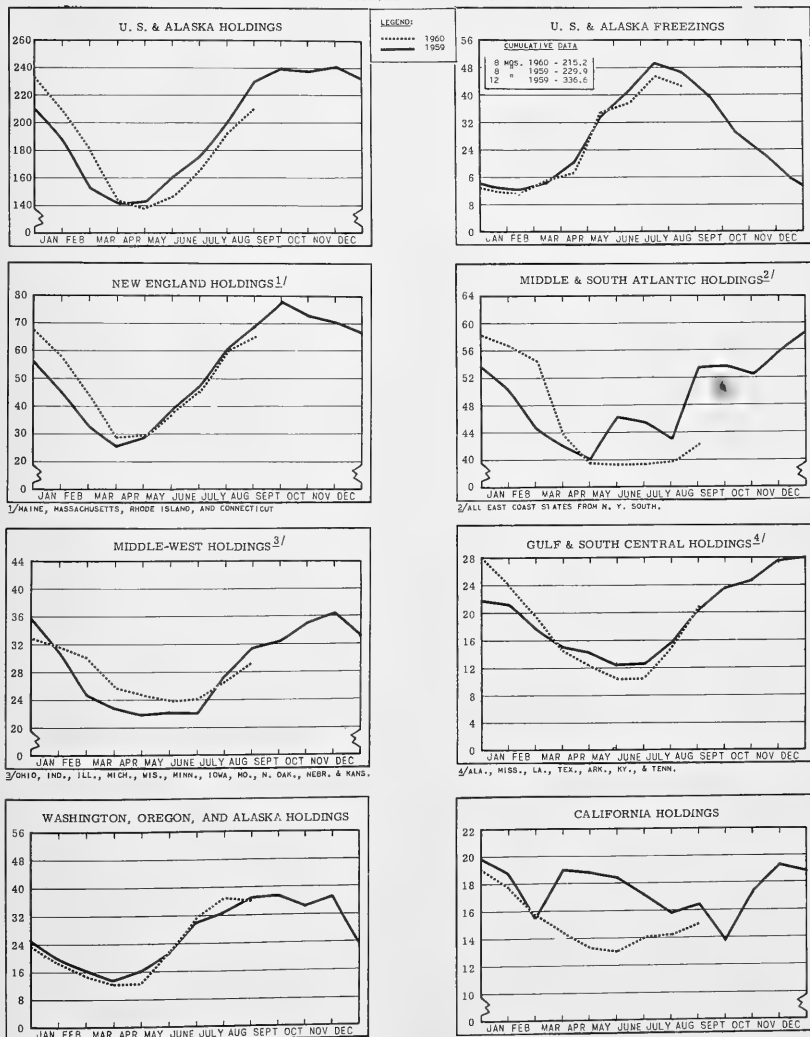


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

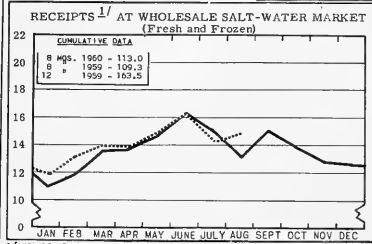
In Millions of Pounds



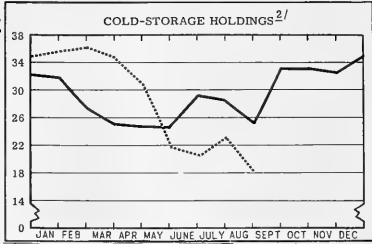
* Excludes salted, cured, and smoked products.

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

In Millions of Pounds

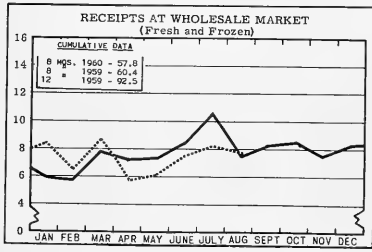


NEW YORK CITY

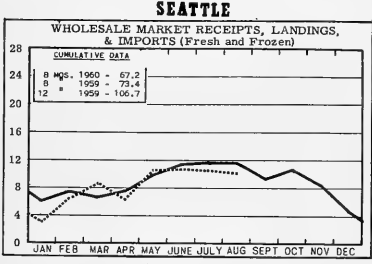
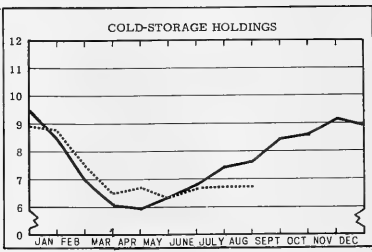


^{1/}INCLUDE TRUCK and RAIL IMPORTS FROM CANADA and DIRECT VESSEL LANDINGS AT NEW YORK CITY.

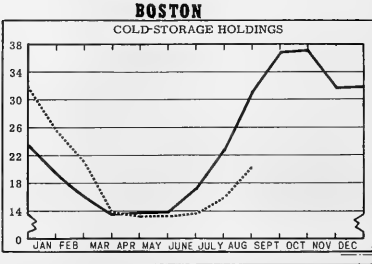
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



SEATTLE



LEGEND:
 1960
 ——— 1959

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

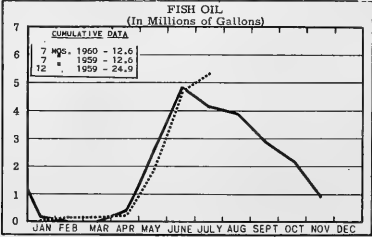
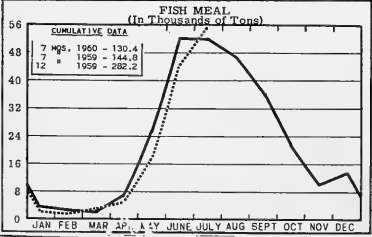
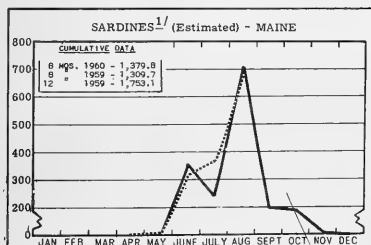
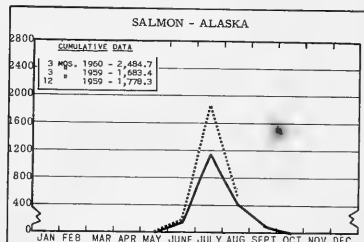
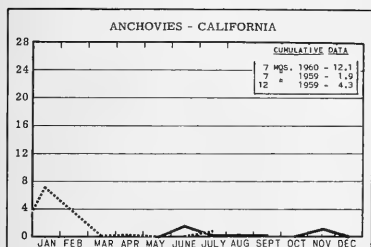
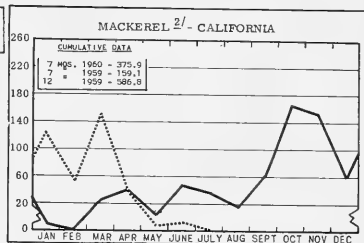
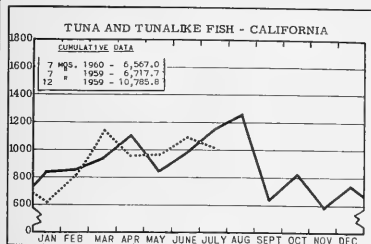


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

In Thousands of Standard Cases



STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES.....	100	1/4 drawn	3 1/2 oz.
SHRIMP.....	48	--	5 oz.
TUNA.....	48	# 1/2 tuna	6 & 7 oz.
PILCHARDS...	48	# 1 oval	15 oz.
SALMON.....	48	1-lb. tall	16 oz.
ANCHOVIES...	48	1/2-lb.	8 oz.

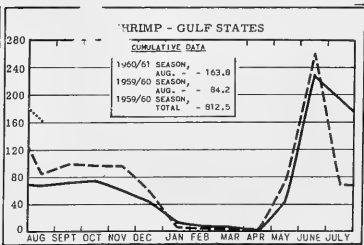
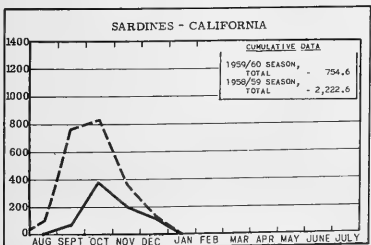
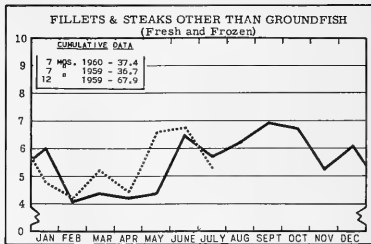
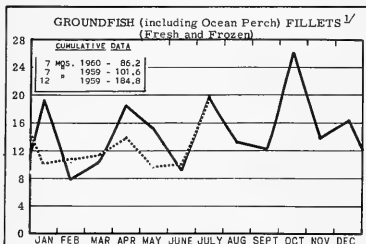


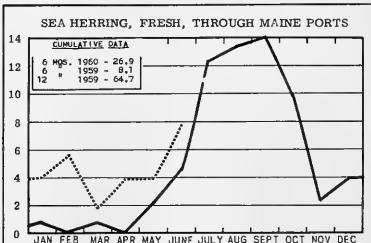
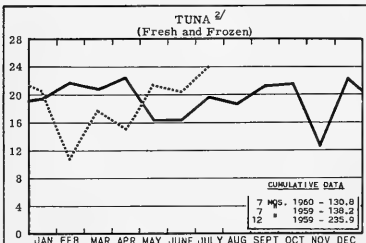
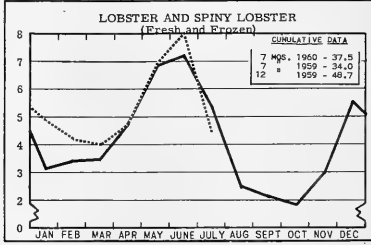
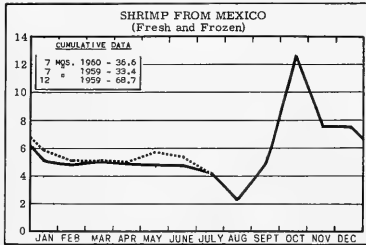
CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds

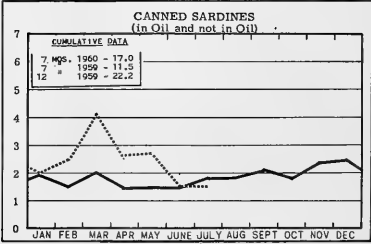
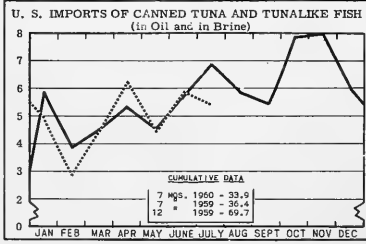
LEGEND:
 1960
 ——— 1959



^{1/}SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1960.



^{2/} EXCLUDES LOINS AND DISCS.





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.
 FL - FISHERY LEAFLETS.
 SL - BRANCH OF STATISTICS LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 WL - WILDLIFE LEAFLETS.
 SSR - FISH - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION).
 SSR - WILDLIFE - SPECIAL SCIENTIFIC REPORTS--WILDLIFE (LIMITED DISTRIBUTION).
 SEP. - SEPRATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

- | Number | Title |
|----------|--|
| CFS-2336 | Hawaii Landings, 1959 Annual Summary, 6 pp. |
| CFS-2348 | Fish Meal and Oil, May 1960, 2 pp. |
| CFS-2351 | Massachusetts Landings, April 1960, 5 pp. |
| CFS-2352 | New York Landings, May 1960, 4 pp. |
| CFS-2353 | California Landings, April 1960, 4 pp. |
| CFS-2354 | North Carolina Landings, June 1960, 3 pp. |
| CFS-2355 | South Carolina Landings, June 1960, 2 pp. |
| CFS-2356 | Texas Landings, May 1960, 3 pp. |
| CFS-2357 | Fish Sticks and Portions, April-June 1960, 3 pp. |
| CFS-2358 | Frozen Fish Report, June 1960, 8 pp. |
| CFS-2359 | Maryland Landings, May 1960, 3 pp. |
| CFS-2360 | Shrimp Landings, April 1960, 6 pp. |
| CFS-2361 | Rhode Island Landings, May 1960, 3 pp. |
| CFS-2362 | Fish Meal and Oil, June 1960, 4 pp. |
| CFS-2362 | (Supplement) - Imports of Fish Meal and Scrap, 1937-1959, 4 pp. |
| CFS-2364 | New Jersey Landings, June 1960, 3 pp. |
| CFS-2366 | Alabama Landings, April 1960, 2 pp. |
| CFS-2367 | Ohio Landings, May 1960, 2 pp. |
| CFS-2368 | Georgia Landings, June 1960, 2 pp. |
| CFS-2369 | South Atlantic Fisheries, 1959 Annual Summary, 6 pp. |
| CFS-2371 | Florida Landings, June 1960, 7 pp. |
| CFS-2374 | Maryland Landings, June 1960, 3 pp. |
| FL-248 | Japanese Whaling in the Bonin Island Area (A Preliminary Report), 16 pp., illus., June 1947. |
| FL-293 | (Revised September 1959) - List of Fishermen's and Fish Shore Workers' Unions in the United States, 8 pp. |
| FL-498 | Culture, Handling and processing of Pacific Coast Oysters, by Lynn G. McKee and Richard W. Nelson, 22 pp., illus., April 1960. |

Wholesale Dealers in Fishery Products (Revised):

- SL- 21 - California, 1959.
 SL- 39 - Tennessee (Mississippi River and Tributaries), 1959.
 SL- 40 - Oklahoma (Mississippi River and Tributaries), 1959.
 SL- 41 - Arkansas (Mississippi River and Tributaries), 1959.
 SL- 43 - Alabama (Mississippi River and Tributaries), 1959.
 SL- 45 - Mississippi (Mississippi River and Tributaries), 1959.
 SL- 46 - Texas (Mississippi River and Tributaries), 1959.

Firms Manufacturing, 1959 (Revised):

- SL- 152 - Oyster Shell Products, 1959.
 SL- 155 - Marine Pearl Shell Buttons, 1959.
 SL- 161 - Producers of Packaged Fish, 1959.
 SSR-Fish. No. 283 - Marquesas Area Fishery and Environmental Data, October 1957-June 1958, by Robert C. Wilson, Eugene L. Nakamura, and Howard O. Yoshida, 110 pp., November 1958.

SSR-Fishing. No. 329 - Use of Fish Pituitaries to Induce Spawning in Channel Catfish, by Kermit E. Sneed and Howard P. Clemens, 14 pp., illus., April 1960.

SSR-Fish. No. 336 - Age and Size Composition of the Menhaden Catch Along the Atlantic Coast of the United States, 1956 (With a Brief Review of the Commercial Fishery), by Fred C. June and John W. Reinjes, 42 pp., illus., April 1960.

SSR-Fish. No. 339 - Fishes Taken in the Menhaden Fishery of Alabama, Mississippi, and Eastern Louisiana, by J. Y. Christmas, Gordon Gunter, and Edward C. Whatley, 12 pp., illus., April 1960.

Sep. No. 598 - Lobster Explorations on Continental Shelf and Slope off Northeast Coast of the United States.

Sep. No. 599 - A Small-Boat Tuna Long-Line Fishery.

Organization and Management of Fishery Cooperative Associations in the United States, by Leslie D. McMullin, 11 pp., processed, 1959. This paper was presented at the Food and Agriculture Organization Technical Meeting on Fishery Cooperatives, May 12-21, 1959, at Naples.

A Report on the Fish and Wildlife Resources Affected by the Bruce Eddy Dam and Reservoir Project, North Fork Clearwater River, Idaho, 47 pp., illus., processed, June 1960.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-6	Mexico's Fish and Shellfish Canning Industry, 1959.
MNL-7	Mexican Fisheries, 1959.
MNL-8	Portuguese Fishing Industry, 1959.
MNL-23	Fisheries of Chile.
MNL-25	Canadian Reduction Plants.
MNL-26	Taiwan Fisheries in 1959.
MNL-27	French Reduction Plants.
MNL-28	Portuguese Reduction Plants.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED:

California Fishery Products Monthly Summary, Part I--Fishery Products Production and Market Data, June 1960; 14 pp. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish; pack of canned tuna, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka Areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; and Mexican frozen shrimp prices for the month indicated.

California Fishery Market News Monthly Summary, Part II--Fishing Information, July 1960, 11 pp., illus. (Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) The first issue of a new publication which includes monthly sea-surface temperature charts for the eastern Pacific, and fishing and research information of interest to the west coast tuna fishing industry and marine scientists. The temperature charts cover that area of the Pacific from the Aleutians in the north to Peru and Chile in the south and offshore to 180° W. longitude. They show for each month the average sea-surface temperature and the deviations from the 30-year average and from the previous year. Research and fishing information indicates that the distribution of tunas and many other commercial species is directly affected by sea-surface temperatures.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, July 1960, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6 Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Gulf Monthly Landings, Production, and Shipments of Fishery Products, July 1960, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, 609-611 Federal Bldg., New Orleans 12, La.) Gulf States shrimp, oyster, finfish, and blue crab landings; crab meat production; LCL express shipments from New Orleans; wholesale prices of fish and shellfish in the New Orleans French Market; sponge sales; and imports at Port Isabel and Brownsville, Texas, from Mexico; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, July 1960, 4 pp. (Market News Service,

U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, June and July 1960, 22 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the months indicated.

Receipts of Fresh and Frozen Fishery Products at New York City's Fulton Fish Market, 1959 (Includes Statistics and Marketing Trends), by T. J. Risoli, 48 pp., processed. (Market News Service, U. S. Bureau of Commercial Fisheries, 155 John St., New York 38, N. Y.) The first part of this annual summary discusses fishery products receipts and marketing trends in the salt-water section of New York's wholesale Fulton Fish Market during 1959. The second part covers marketing trends and receipts in the wholesale fresh-water fish market for 1959. The third part consists of a series of statistical tables giving the receipts of finfish and shellfish in the salt-water section of Fulton Fish Market, 1959; receipts by months and methods of transportation; receipts by species, methods of transportation, states and provinces; prices of selected frozen fishery products, 1959, in New York Metropolitan Area; finfish receipts by points of origin and methods of transportation; shellfish receipts by points of origin and methods of transportation; and imports of selected fresh and frozen fishery products, 1959 compared with 1958.

New York City's Wholesale Fishery Trade--Monthly Summary for June 1960, 18 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the month indicated.

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, July 1960, 11 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

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

Distribution and Abundance of Eggs of the Pacific Sardine, 1952-1956, by Elbert H. Ahlstrom, *Fishery Bulletin* 165 (from *Fishery Bulletin of the Fish and Wildlife Service*, vol. 60, pp. 185-213), 32 pp., illus., printed, 30 cents, 1959.

Education in the Field of Oceanography (Hearing Before the Subcommittee on Earth Sciences of the Committee on Science and Astronautics, U. S. House of Representatives, Eighty-Sixth Congress, First Session, on H. R. 8298), no. 43, 39 pp., printed, August 25, 1959.

Fishery Statistics of the United States, 1958, by E. A. Power, *Statistical Digest* 49, 424 pp., illus., printed, \$2, 1960. The latest in a series of annual statistical reports on the fisheries of the United States, Alaska, and Hawaii, which contains data on the catch and ex-vessel value of fishery products, employment in the fisheries, quantity of gear operated, the number of fishing craft employed in the capture of fishery products, and certain information on the production and value of manufactured fishery products and byproducts. Special features are data on the relative volume and value of the domestic catch on the United States catch taken on the high seas off foreign coasts. Historical fishery statistics in the report include data on the United States Atlantic cod catch from 1893 to 1958, inclusive. The statistical surveys, conducted during 1959 for 1958 data, covered all sections of the United States. The catch of fishery products in all sections of the United States and Alaska during 1958 totaled approximately 4.7 billion pounds, valued at \$371 million ex-vessel—a decrease of one percent in quantity but an increase of 6 percent in value as compared with 1957.

Menhaden ranked first in quantity among the species taken by United States fishermen, yielding a catch of 1.5 billion pounds—33 percent of the total landings. Although landings of menhaden were up in all areas except New England and Middle Atlantic States as compared with those in 1957, the total production in all areas declined.

Shrimp was again the most valuable single item taken by domestic fishermen, amounting to 214 million pounds, valued at nearly \$73 million ex-vessel. The Gulf of Mexico is the major shrimp-producing area, and accounted for 81 percent of the volume and 88 percent of the value of the total 1958 shrimp catch. The increase in total shrimp landings of 10 million pounds in 1958 as compared with 1957 was due to the development of the fishery for small shrimp off Washington, Oregon, and Alaska.

Several of the major food fish recorded noteworthy increases during the year: salmon (up 42 million pounds); North Pacific halibut (up 3 million pounds); and New England groundfish (up 17 million pounds). The return of sardines to California waters, after a partial absence since 1951, resulted in a catch of 207 million pounds—four-and-a-half times the 1957 production. A decline in the landings of Pacific and jack mackerel, anchovy, sea herring, and oysters were primarily responsible for the 1958 decline in the total landings as compared with the previous year.

The pack of canned fishery products in the United States, Alaska, Hawaii, Puerto Rico, and American Samoa in 1958 amounted to over 1.1 billion pounds valued at nearly \$389 million to the packers. Industrial fishery products amounted to 248 thousand tons of fish meal and scrap, 22 million gallons of fish oils, and 260 million pounds of fish solubles and homogenized condensed fish. Production of fresh and frozen packaged fish fillets and steaks totaled 155.9 million pounds valued at \$51.2 million to the processors. This represented an increase of 1.4 million pounds in volume and nearly \$4.5 million in value over the 1957 production. United States foreign trade in fishery products in 1958 was valued at over \$358 million of which \$327 million represented the value of imports and \$31 million the value of exports. The value of imported fishery products in 1958 was 10 percent greater than in the previous year. Among the more important imports during 1958 were frozen tuna, shrimp, and fresh and frozen groundfish fillets and steaks. The value of exports of domestic fishery products was 14 percent less than in 1957.

The economic data presented in this report are essential for use by persons engaged in the commercial fisheries and by governmental agencies concerned with the regulation, protection, and development of commercial fisheries. Biological information included, which is important to sound fishery management, provides detailed information of fluctuations in the commercial catch by species, locality, gear, and type of craft operated.

Oceanography in the United States (Hearings Before the Special Subcommittee on Oceanography of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-Sixth Congress, First Session), 399 pp., illus., printed, 1959.

Propagation and Distribution of Food Fishes for the Calendar Years 1957-1958, *Statistical Digest* 46, 48 pp., printed, 20 cents, 1960.

Seasonal Abundance and Vertical Movements of Planktonic Crustacea in Lake Michigan, by LaRue Wells, *Fishery Bulletin* 172 (from *Fishery Bulletin of the Fish and Wildlife Service*, vol. 60), 31 pp., illus., printed, 25 cents, 1960.

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 ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALABAMA:

"Sporadic Mass Shoreward Migrations of Demersal Fish and Crustaceans in Mobile Bay, Alabama," by Harold Loesch, article, *Ecology*, vol. 41, no. 2, April 1960, pp. 292-298, illus., printed. Duke University Press, Box 6697, College Station, Durham, N. C.

ALGAE:

An Annotated List of the Marine Algae of British Columbia and Northern Washington (Including Keys to Genera), by Robert F. Scagel, *National Museum of Canada Bulletin* No. 150, 289 pp., illus., printed, C\$2.00. Department of Northern Affairs and National Resources, Ottawa, Canada, 1957.

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

ARGENTINA:

La Merluza del Mar Argentino--Biología y Taxonomía (The Hake of Argentine Waters--Biology and Taxonomy), by Victor Angelescu, Francisco S. Gneri, and Alberto Nani, no. H. 1004, 246 pp., illus., printed in Spanish. Secretaría de Marina, Servicio de Hidrografía Naval, Buenos Aires, Argentina, 1958

AUSTRALIA:

Commonwealth Scientific and Industrial Research Organization, Division of Fisheries and Oceanography Annual Report, 1958-1959, 24 pp., processed. C. S. I. R. O., Marine Laboratory, P. O. Box 21, Cronulla, New South Wales. An annual report of the Division of Fisheries and Oceanography which is concerned with the study of the aquatic resources of Australia, including whales, the more important fish, crustacea, and shellfish. Fundamental to this study is an examination of the environment to ascertain the variations in oceanographic conditions which affect biological production and which are to a large extent responsible for fluctuations in fish occurrences.

Fisheries Research Vessel "Derwent Hunter," Report 21, 31 pp., illus., processed. Commonwealth Scientific and Industrial Research Organization, Division of Fisheries and Oceanography, Marine Biological Laboratory, Sydney, Australia, 1959.

Know Your Fishes (An Illustrated Guide to the Principal Commercial Fishes and Crustaceans of Queensland), by T. C. Marshall, E. M. Grant and N. M. Haysom, Ichthyological Notes, vol. 1, no. 4, 146 pp., illus., printed. Department of Harbours and Marine, Brisbane, Queensland, Australia, May 1959.

BALEARIC ISLANDS:

Carta de Pesca de las Baleares. I--Este y sur de Menorca (Chart of the Balearic Islands' Fishery. I-- East and South of Minorca), by Miguel Oliver, no. 26, 1959, illus., printed in Spanish. Instituto Espanol de Oceanografía, Madrid, Spain.

BOATING:

Recreational Boating Guide, CG-340, 79 pp., illus., printed, 40 cents. U. S. Coast Guard, Washington 25, D. C., June 1, 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Although this handbook is intended primarily for boating enthusiasts, it will also be of interest to those in commercial fisheries as well as related fields. Discusses in some detail the numbering of boats propelled by engines of more than 10 hp; the legal minimum equipment requirements; other desirable equipment; rules for proper operation; aids to navigation; hints on safety afloat; rules for unpowered boats; emergency procedures; and U. S. Coast Guard Auxiliary instructions. The appendices contain the Federal Boating Act of 1958, the amended Motorboat Act of April 25, 1940, lists of Coast Guard districts; and Government publications of interest to boatmen.

CALIFORNIA:

Statistical Report of Fresh, Canned, Cured, and Manufactured Fishery Products, 1959. Circular No. 34, 18 pp., illus., printed. Department of Fish and Game, Biostatistical Section, Marine Resources Operation, Sacramento, Calif., 1960. This report, the latest in a series of annual reports on commercial fishery

production in California, includes statistical tables on landings by area and by species, tuna imports, fish processing plants, and pack of canned fish. Data are also included on volume of other types of processed fish, canned sardines, sardine meal and oil production, and the annual pack of anchovies, tuna, bonito, and yellowtail.

CAMBODIA:

Etude sur la Peche au Cambodge (Study of the Fisheries of Cambodia), by John E. Bardach, 82 pp., processed in French, June 1959. USOM, Phnom-Penh, Cambodia.

CANADA:

"Cruise No. 20 of the A. T. Cameron," by G. J. Gillespie, article, Trade News, vol. 12, no. 11, May 1960, pp. 3-5, illus., printed. Trade News, Department of Fisheries, Ottawa, Canada. Covers a cruise of the Canadian Government fisheries research vessel A. T. Cameron, centered mainly around Western and Emerald Bankslaying in the Atlantic southeast of Nova Scotia, to study comparative fishing between the larger vessel and smaller craft, Haranguu. Both vessels had been used for survey work on the same populations of groundfish at different times of the year. To be able to compare data obtained by the two vessels, the cruise was designed to test their fishing abilities by having them work side by side on the same populations of fish at the same time.

Economic Survey of Salmon Fishermen in British Columbia, 1953 (Interim Report--Based on Records Obtained from 266 Salmon Fishermen), by Blake A. Campbell and D. R. Buchanan, 57 pp., illus., processed. Department of Fisheries of Canada, Markets and Economic Service, Vancouver, B. C., Canada, January 1955.

The Freshwater Fishes of Canada, by E. P. Slastenko, 387 pp., illus., printed. Kiev Printers, 686 Richmond St. W., Toronto, Ontario, Canada, 1958.

The Freshwater Fishes of New Brunswick: A Checklist with Distributional Notes, by W. B. Scott and E. J. Crossman, No. 51, 45 pp., printed. The Royal Ontario Museum, Division of Zoology and Palaeontology, 100 Queen's Park, Toronto, Canada, June 20, 1959.

Journal of the Fisheries Research Board of Canada, vol. 17, no. 3, May 1960, 157 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes, among others, these articles: "Salinity Preference, Thyroid Activity and the Seaward Migration of Four Species of Atlantic Salmon (*Oncorhynchus*)," by Bertha Baggerman; "Biochemical Studies on Sockeye Salmon During Spawning Migration. XI--The Free Histidine Content of the Tissues," by J. D. Wood, D. W. Duncan, and M. Jackson; "The Phosphorus-Containing Fractions of Sterile Lingcod Muscle During Storage at 0° C.," by Neil Tomlinson, Vera M. Creelman, and K. G. Reid; "A Qualitative and Quantitative Study of the Plankton of the Quoddy Region in 1957 and 1958 with Special Reference to the Food of Herring," by J. E. Henri Legare and Delphine C. MacLellan; and "Iosine in the Muscle of Pacific Salmon Stored in Ice," by Vera M. Creelman and Neil Tomlinson.

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

CANNED FISH:

"Le Conserves di Scombridi con Particolari Riguardi al tonno" (Canned Scombroid Fishes with Special Reference to Tuna), by A. Piegali, article, *Monografie di Tecnologia della Stazione Sperimentale per l'Industria delle Conserven Alimentari*, vol. 4, 1958, 141 pp., illus., printed in Italian. Stazione Sperimentale per l'Industria delle Conserven Alimentari, Parma, Italy.

CAPELIN:

On the Migrations and Spawning of the Barents Sea Capelin in 1953 and 1954, by V. S. Prokhorov, 8 pp., processed. (Translated from Trudy Pinro, vol. 10, 1957, pp. 230-243.) Fisheries Laboratory, Lowestoft, England, 1959.

CARP:

Die Karpfenteichwirtschaft in der Deutschen Demokratischen Republik und Ihre Wissenschaftlichen Hauptprobleme (Carp Fish-Pond Farming in the German Democratic Republic and its Principal Scientific Problems), edited by William Schaperclaus, *Sitzungsberichte*, vol. 7, no. 7, 33 pp., illus., printed in German. Deutsche Akademie, Landwirtschaftswissenschaften, Berlin, Germany, 1958.

CEYLON:

Fischer auf Ceylon--Ein Beitrag zur Wirtschafts- und Bevolkerungs-Geographie des Indischen Subkontinents (Fishes of Ceylon--A Study of the Economics and Community-Life of the Indian Subcontinent), by Fritz Bartz, vol. 27, 121 pp., illus., printed in German. Bonner Geographische Abhandlungen, Institut der Universitat Bonn, Bonn, Germany, 1959.

COD:

"Aspectos de Industria Nacional do Bacalhau" (Outlook of the National Cod Industry), by A. Torres Botelho, article, *Conservas de Peixe*, vol. 15, no. 169, April 1960, pp. 47-48, illus., printed in Portuguese. Conservas de Peixe, Sociedade Astoria, Lda., Requeirao dos Anjos, 68, Lisbon, Portugal.

COLD STORAGE:

"Typical Designs of Cold Stores for Fish," by L. M. Kazanskiy, article, *Rybne Khoziaistvo*, no. 7, July 1959, pp. 65-72, illus., printed in Russian. Rybne Khoziaistvo, Kotel' n'icheskaia Naberezhnaia D 1/15, Souizpechat' Otdel' "Zhurnal-Pochtai," Moscow Zh-240, U. S. S. R.

DEMERSAL FISH:

Rapports et Proces-Verbaux des Reunions (Contributions to Special Scientific Meeting on Measures for Improving the Stock of Demersal Fish in the Baltic), vol. 147, 96 pp., illus., printed, Kr. 20 (US\$2.90). Conseil Permanent International pour l'Exploration de la Mer (International Council for Exploration of the Sea), Charlottenlund Slot, Denmark, August 1959.

FISH COOKERY:

The Art of Fish Cookery, by Milo Miloradovich, 471 pp., illus., printed. Doubleday & Company, Inc. Garden City, N. Y., 1949.

FISH PONDS:

How to Look After a Fishpond, by L. Davambe, 31 pp., printed, A. Is. Od. (11 U. S. cents). South Pacific Commission, Literature Bureau, Box 5254, G.P.O., Sydney, Australia.

FISHWAYS:

The Size and Location of Escape Ports for Bypassing Salmonid Fish at a Screened Diversion Canal (The- sis of Harry Henry Wagner for the Master of Science Degree in Fisheries), 85 pp., illus., processed. Oregon State College, Corvallis, Oreg., April 1959.

FLORIDA:

Apalachicola Watershed, Fish Management Bulletin No. 4, 15 pp., illus., printed. Florida Game and Fresh Water Fish Commission, Fisheries Division, Tallahassee, Fla., July 1959.

FROZEN FISH:

"Frozen Fish in Cabinets Has Limited Storage Life," article, *Frozen Foods*, vol. 12, no. 6, June 1959, p. 386, printed. Frozen Foods, Refrigeration House, Victoria Rd., Woking, England.

FUR SEALS:

"Blood Types in Fur Seals," by Kazuo Fujino and John E. Cushing, article, *Science*, vol. 131, no. 3409, April 29, 1960, p. 1310, printed. American Association for the Advancement of Science, 1515 Massachusetts Ave. N.W., Washington 5, D. C.

GEAR:

"En Ny Synthetisk Fiber til Fiskeredskap" (Coulene--A New Synthetic Fiber for Fishing Gear), article, *Fangst og Fiske*, vol. 11, no. 1, 1959, printed in Norwegian. Fangst og Fiske, Landsalien 19, Bergen, Norway.

How to Look After Fishnets, by L. Devambe, 15 pp., printed, A. Is. Od. (11 U. S. cents). South Pacific Commission, Literature Bureau, Box 5254, G.P.O., Sydney, Australia.

Net Repair Manual, by Stacy V. Gebhards, 23 pp., illus., processed. Department of Fish and Game, Boise, Idaho, 1960. Although most fishing nets today are machine tied and are purchased ready-made from various firms, net repairs must still be done by hand. The purpose of this manual is merely to acquaint the beginner with the proper procedure in net mending. Proficiency in mending, according to the author, can come only through practice. The techniques described are essentially those which are used by commercial fishermen in the Illinois River Valley with some modifications by the author.

GENERAL:

"The Buoyancy of Marine Animals," by Eric Denton, article, *Scientific American*, vol. 203, no. 1, July 1960, pp. 118-128, illus., printed. Scientific American, Inc., 415 Madison Ave., New York 17, N. Y. Most fishes are equipped with swim bladders which give them neutral buoyancy and save them the effort of continuous swimming. The cuttlefish and the cranchid squid have developed quite different kinds of flotation organs. They anticipated man in using the working principles of the submarine and the bathyscaph, the one endowing the cuttlefish with active control of its buoyancy, the other permitting the squid to live at great depths.

Journal du Conseil, vol. 25, no. 2, March 1960, 124 pp., illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlotten-

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

lund Slot, Denmark. Includes, among others, these articles: "Upper Lethal Temperatures for Larval Salmonids," by H. M. Bishai; "The Effect of Water Currents on the Survival and Distribution of Fish Larvae," by H. M. Bishai; "Food Habits of Larval Cod, Haddock, and Coalfish in the Gulf of Maine and Georges Bank Area," by Robert R. Marak; "New Implements for Fish Tagging," by Arnl Frøloriksson, Olav Aasen and Arne Revheim; "Mesh Selection and Apparent Growth of Haddock," by Rodney Jones; "A Note on the Dependence of Catches on Temperature and Wind in the Buchan Pre-Spawning Herring Fishery," by R. E. Craig; "Some Observations on the Body Proportions of North Sea Autumn Spawning Herring," by R. Muzinic and B. B. Parrish (with an appendix by J. A. Pope); and "Observations on the Size and Numbers of Herring Taken by the Herring Trawl," by I. D. Richardson.

Turn to the Sea, by Athelstan Spilhaus, 50 pp., illus., printed, National Academy of Sciences, National Research Council, Washington D. C., 1959.

GENERAL AGREEMENT ON TARIFFS AND TRADE: Negotiations Under the Trade Agreements Act of 1934 as Amended and Extended (List of Products on which the U. S. May Seek Concessions from Other Countries; Notice of Public Hearings), Department of State Publication 6987, 69 pp., processed, 30 cents. The Interdepartmental Trade Agreements Organization, Washington, D. C., May 1960. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Fish and fishery products are included among the products listed.

Negotiations Under the Trade Agreements Act of 1934 as Amended and Extended (Notice of U. S. Intention to Negotiate; List of Products to be Considered for Possible U. S. Concessions; Notice of Public Hearings), Department of State Publication 6986, 118 pp., processed, 40 cents. Interdepartmental Trade Agreements Organization, Washington, D. C., May 1960. (For sale by Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Fish and fishery products are among the products listed.

HAWAII:

Handbook of Hawaiian Fishes, by William A. Gosline and Vernon E. Brock, 381 pp., illus., printed, \$11.00. University of Hawaii Press, Honolulu 14, Hawaii, 1960. This is the first handbook for the identification of fishes of the Hawaiian Islands known to the reviewer since Jordan and Gilbert's two-volume study published in 1905, now out of print. The authors have simplified as much as possible the process of determining correctly the species of Hawaiian fishes. The nontechnical person as well as the trained ichthyologist will find much of interest in this book. The secondary purpose of the handbook—to provide definitive common names for the more important commercial fishes in order to achieve uniformity of names for catch statistics and law enforcement—will be of interest to commercial fisheries interests. The preferred common name is identified easily since it is placed immediately under the scientific name. But less desirable common names are also given. Every native inshore fish that has been validly recorded from Hawaiian waters is included.

Intentionally-introduced fresh-water and marine species are also described although the section on the latter is a short one. Except for scientific names, scientific terms have been generally avoided. Illustrations consist of 279 figures which are aids to identification. Also included are five beautiful color plates which portray the beauty of Hawaiian fishes. Keys are provided for all Hawaiian fish families and for all inshore species. The authors point out in their preface that the book is the result of widespread cooperation and credits are widely subdivided. Among the chapters in the book are the following: Ecology of Hawaiian Fishes; the Nature and Derivation of Hawaiian Fishes and Keys to Families; and Accounts of Families and Species of Hawaiian Fishes. There are two appendices: Intentionally Introduced Marine Species; and Check List of Native Hawaiian Fishes. The book is indexed.

—Joseph Pileggi

HERRING:

Scale Character and Growth Rate (A Study on Small Fat Herring from North Norway), by Mahhargo Soeprapto, vol. 12, no. 5, 16 pp., illus., printed, A. S. John Griegs Boktrykkeri, Bergen, Norway, 1959.

Vintersild (Winter Herring Fishery), by Magne Flem and Bjarne Skarbovik, 36 pp., illus., printed in Norwegian and English. Sunnmorsposten, Aalesund, Norway, 1959. An unusual booklet of photographs depicting many aspects of the winter herring fishery and the hardy fishermen who work it. The text accompanying the photos describes the preparations for the season in early January, the location of the fishing grounds just outside the coastal fringe of islands, the purse-seiners and drifters which catch the herring, locating the herring, methods of catching, the fishing villages, and plants for processing the herring.

INDIA:

"Observations on the Trawl Fisheries of the Bombay and Saurashtra Waters, 1949/50 to 1954/55," by R. Jayaraman and others, article, *Indian Journal of Fisheries*, vol. 6, no. 1, April 1959, pp. 56-144, illus., printed, Ministry of Food and Agriculture, Government of India, New Delhi, India.

JAPAN:

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 10, no. 3, November 1959, 112 pp., illus., printed in Japanese with English abstracts. Faculty of Fisheries, Hokkaido University, Hakodate, Japan. Contains, among others, the following articles: "Studies on Air Screen in Water. 1—Preliminary Observation of Behavior of Fish School in Relation to an Air Screen," by Kiichiro Kobayashi and others; "Chemical Studies on Marine Algae. XIII—Isolation of Crystal L-Citrulline from *Chondrus ocellatus* and *Rhodoglossum pulchrum*," by Mitsuo Kuriyama, Mitsuzo Takagi, and Kiichi Murata; "Quality of Flatfish from Hakodate. Part 2—The Factors Deciding the Quality. 3—Relations Between the Quality and the Amount of Connective Tissue. 4—Relations Between the Quality and the Amount of Acid Soluble Phosphorus. 5—Relations Between the Quality and the Extractive Nitrogen," by Keiichi Oishi; and "The Territorial Waters in the U. S. S. R.," by Akira Suzuki.

Bulletin of the Faculty of Fisheries, Hokkaido University, vol. 10, no. 4, February 1960, 90 pp., illus.,

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

printed in Japanese with English abstracts. Faculty of Fisheries, Hokkaido University, Hakodate Japan. Includes, among others, the following articles: "Quality of Flatfish from Hakodate. Part 3--The Factors Deciding the Quality. 6--Relations Between the Quality and the Amino Acid Composition of the Muscle Extractives," by Keiichi Oishi; "Observations on the Ship's Drifting due to Wind Action," by Shoji Saito, and "Studies on the Heat Sterilization of Fish Sausage," by Eiichi Tanikawa and others.

On the Fishes of the Family Chlorophthalmidae, by Toshiji Kamohara. Research Report of the Kochi University, vol. 5, no. 15, 17 pp., illus., printed in Japanese with English summary. The Kochi University, Kochi, Japan, 1959.

Illustration of Japanese Fishing Boat and Fishing Gear, 228 pp., illus., printed in Japanese and English, \$6.00. Japan Association for Agriculture and Forestry, Norin-sho Bldg., 2 Chome Kasumigaseki, Chiyodaku, Tokyo, Japan, 1959.

Memoirs of the Faculty of Fisheries of Kagoshima University, vol. 8, February 1960, 193 pp., illus., printed in Japanese with English summaries. The Faculty of Fisheries, Kagoshima University, Kagoshima, Japan. Contains, among others, the following articles: "Studies on the Life Histories of the Flying-Fishes Found in the Adjacent Waters of Japan-II," by Sadahiko Imai; "Carbonyl Compounds in Fish as Related to the Deterioration, III--Factors Affecting the Formation of Volatile Carbonyl Compounds in Fish Flesh," by Fuyuo Ota; "On the Process of the Formation of Lower Carbonyl Compounds in the Enzymatic Oxidation of Linoleic Acid," by Fuyuo Ota; "On the Storage of Frozen Whole-Round Skipjack, I--The Denaturation of Skipjack Muscle Protein Under the Freezing and Cold Storage," by Jun-ichi Nishimoto and Kazuo Tanaka; and II--Histological Study of the Frozen Skipjack Muscle Tissue," by Jun-ichi Nishimoto and Kazuo Tanaka; "Studies on the Biochemical Change in Fish Muscle, XI--On the Enzymic Degradation of ATP by Unpurified Actomyosin Fraction of Fish Muscle," by Tomio Hidaka and Kaname Saito; "Biophysical Studies on the Auditory Characteristic of Fish, II--Directional Audibilities in Various Types of Lateral Line," by Toshiro Kuroki; "Simplified Ultrasonic Shell-Plate-Flaw-Detector for Fishing Vessel with the Use of the Standing-Wave Technique in the Thickness-Measurement," by Yoshikazu Narasako, Sukehiro Oya and Akira Yamabe; "Studies on the Constitutional State of Skipjack Fishing Ground over the Waters near the Tokara Retto, I--On the Relation between the Water Temperature and the Catching Condition in the Fishing Ground," by Tomokazu Morita; "A Consideration on the East China Sea Region Mackerel Fisheries," by Sumio Enami; "Studies on Bubble Net, I--Driving and Intercepting Effect on Some Fresh-Water Fishes," by Sumio Enami; "On the Physical Analysis of the Fixed-Fishing-Net Resistance," by Masaji Kanamori; and "Studies on the Radiological Contamination of Sea Water, Planktons and Fishes in the Western Region of the North Equatorial Current during the Period from 1958 to 1959" by Kaname Saito, Munee Sameshima, and Tomio Hemmi.

Memoirs of the Faculty of Fisheries, Hokkaido University, vol. 7, no. 1/2, 155 pp., illus., printed. The Faculty of Fisheries, Hokkaido University, Hakodate, Japan, 1959. Includes, among others, the

following articles: "The Marine Algae of Southern Saghalien," by J. Tokida; "Studies on the Proteins of the Meat of Sea Cucumber (*Stichopus japonicus* Selenka)," by E. Tanikawa; "Studies on the Manufacture of Algin from Brown Algae," by N. Suzuki; "Studies on the Tropomyosin of Squid," by K. Yoshimura; "Studies on Fishing Ground, Fishing Gears, and Fishing Technique in One-Boat Medium Trawl Fishery," by I. Saito; "Physico-Chemical Studies on the Activation and Fertilization of Fish Eggs," by S. Hamono; "The Species of *Gracilaria* and *Gracilariaopsis* from Japan and Adjacent Water," by H. Ohmi; "Studies on the Technical Problems in the Processing of Canned Salmon," by E. Tanikawa; and "Studies on Technical Problems in the Processing of Canned Crab," by E. Tanikawa.

LAW OF THE SEA:

La Plataforma Continental y los Problemas Jurídicos del Mar (The Continental Shelf and the Juridical Problems of the Sea), by Humberto Lopez Villamil, 69 pp., printed in Spanish. Talleres Graficos, Juan Bravo, 3, Madrid, Spain, 1958.

The United States and the Treaty Law of the Sea, by Henry Reiff, 451 pp., printed. University of Minnesota Press, Minneapolis 14, Minn., 1959.

LAW OF THE SEA CONFERENCE:

La Conferencia de Ginebra y la Anchura del Mar Territorial (The Geneva Conference and the Extent of the Territorial Sea), by Alfonso Garcia Robles, 410 pp., printed in Spanish. Libreria de Porrua Hermanos y Cia., S. A., Mexico D. F., Mexico.

LOBSTER:

"Many Types of Lobster Pots Used in Wales," article, *World Fishing*, vol. 8, no. 3, March 1959, pp. 41-43, illus., printed. World Fishing, John Trundell (Publishers), Ltd., Temple Chambers, Temple Ave., London EC4, England.

"World's First Quick-Freeze Lobster Boat," article, *Trade News*, vol. 12, no. 11, May 1960, p. 17, illus., printed. Trade News, Department of Fisheries, Ottawa, Canada. The Francoise Christine is the first quick-freeze lobster fishing vessel in the world which carries out vacuum-packing of lobster meat on board ship. The canning and packing process under vacuum is discussed.

MACKEREL:

"El Pejerrey" (The Mackerel), by F. Lahille, article, *Boletín del Ministerio de Agricultura de la Nación*, vol. 28, no. 3, July-September 1929, pp. 261-395, illus., printed in Spanish. Biblioteca del Ministerio de Agricultura, Paseo Colon 974, Buenos Aires, Argentina.

MISCELLANEOUS:

Substances Responsible for Taste and Smell in Fish, by F. Bramstedt, Translation Series No. 235, 15 pp., processed. (Translated from *Archiv für Fischereiwissenschaft*, vol. 8, pp. 94-103.) Fisheries Research Board of Canada, Technological Station, Grande Riviere, Quebec, Canada, 1959.

NIGERIA:

Annual Report, Fisheries Division, Ministry of Agriculture, 1958-59, Official Document No. 16 of 1960,

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9 pp., printed, 1s (about 14 U. S. cents). Government Printer, Eastern Region, Enugu, Nigeria. Discusses the activities and accomplishments of the Fisheries Division of the Eastern Region of Nigeria during 1958-59. Contains sections on the organization; fisheries development plan, 1958-62; colonial development and welfare fisheries scheme; fisheries extension experimental fishing and investigations, and fresh-water fisheries.

NORWAY:

"Fettinhold i Vintersild 1960" (Fat Content of Winter Herring in 1960), by Fredrik Villmark, article, *Fiskets Gang*, vol. 46, no. 19, May 12, 1960, pp. 275-276, illus., printed in Norwegian. *Fiskets Gang*, Postgiro Nr. 691 81, Bergen, Norway.

"La Industria Noruega de Conservas de Pescado en el Ano Ultimo" (The Norwegian Fish Canning Industry in 1959), article, *Industria Conservera*, vol. 26, no. 249, March 1960, pp. 67-68, printed in Spanish. *Industria Conservera*, Calle Marques de Valladares, 41, Vigo, Spain.

"Rapport om Fiskeforsok med Bankliner pa Rostbanken med M/K Vitamin av Tromso Februar/Mars 1960" (Report on Line Fishing at Rostbanken by the Research Vessel *Vitamin* out of Tromso Feb./Mar. 1960), by Kaare Halmo, article, *Fiskets Gang*, vol. 46, no. 23, June 1960, pp. 354-357, illus., printed in Norwegian. *Fiskets Gang*, Postgiro Nr. 691 81, Bergen, Norway.

OCEAN PERCH:

The Fisheries of the Redfish in the Southern Part of the Barents Sea and in the Kopytov Area, by V. I. Travin, 13 pp., processed. (Translated from *Trudy Pnro*, vol. 10, 1957, pp. 161-171.) Fisheries Laboratory, Lowestoft, England, 1959.

Sex and Age Composition of the Beaked Redfish (SEBASTES MENTELLA Travin) of the Kopytov Area, by YE. I. Surkova, 15 pp., processed. (Translated from *Trudy Pnro*, vol. 10, 1957, pp. 172-185.) Fisheries Laboratory, Lowestoft, England, 1959.

OCEANOGRAPHY:

Data Report for Two IGY Cruises, by Hugh J. McLellan, A. & M. Projects 137 & 24, Reference 59-15D, 117 pp., illus., processed. The Agricultural and Mechanical College of Texas, Department of Oceanography and Meteorology, College Station, Texas, April 1959.

Investigations of Climate and Oceanographic Factors Influencing the Environment of Fish (Covering Period of July 1, 1959-September 30, 1959), by Dean F. Bumpus, Reference No. 59-49, 9 pp., illus., printed. Woods Hole Oceanographic Institution, Woods Hole, Mass., October 1959.

A Method for Measuring Eddy Diffusion in Coastal Embayments, by Frank W. Moon, Jr., Charles L. Breitschneider and Donald W. Hood, Series No. 84, 13 pp., illus., printed. (Reprinted from *Institute of Marine Science*, vol. 4, no. 2, July 1957). Department of Oceanography of the Agricultural and Mechanical College of Texas, Department of Oceanography and Meteorology, College Station, Texas, November 1957.

Net Weekly Variation of Vertical Temperature Structure in the Upper Ocean Layers (Autumn, North Atlantic), by Robert A. Gilcrest, A. & M. Project 24, Reference 57-2T, 77 pp., illus., processed. The Agricultural and Mechanical College of Texas, Department of Oceanography and Meteorology, College Station, Texas, January 1957.

Oceanography and Meteorology of the Gulf of Mexico (Annual Report, May 1, 1958-April 30, 1959), by Hugh J. McLellan, A. & M. Project 24, Reference 59-16A, 42 pp., processed. Agricultural and Mechanical College of Texas, Department of Oceanography and Meteorology, College Station, Tex., 1959.

Resultats Scientifiques des Campagnes de la CALYPSO (Scientific Results of Calypso Cruises), Annales de l'Institut Oceanographique (Records of the Oceanographic Institute), vol. 37, 342 pp., illus., printed in French. L'Institut Oceanographique, 120 Blvd. Saint-Germain, Paris, France, 1959. Covers the "Campagne 1956 dans le Golfe de Guinee et aux Iles Principe, Sao Tome et Annobon" (The 1956 Cruise in the Gulf of Guinea and on the Principal Islands of Sao Thome and Annobon); "Campagne 1956 sur les Cotes de Provence" (The 1956 Cruise off the Coasts of Provence); "Campagne 1957 dans le Golfe de Genes" (The 1957 Cruise in the Gulf of Genoa); and "Campagne 1958 en Mer d'Alboran et dans la Bate Ibero-Marocaine" (1958 Cruise in the Sea of Alboran and in the Spanish Moroccan Bay).

OYSTERS:

"Oyster Farming," by George W. Allen, article, *Alabama Conservation*, vol. 31, no. 6, April-May 1960, pp. 4-6, illus., printed. Alabama Dept. of Conservation, 711 High St., Montgomery, Ala. Discusses various aspects of oyster farming--selection and preparation of oyster beds, method of sowing spat, predators and diseases of oysters, and outlook for the oyster industry.

"Oysters Year 'Round," article, *Louisiana Conservationist*, vol. 12, nos. 5-6, May-June 1960, pp. 10-11, illus., printed. Louisiana Wild Life and Fisheries Commission, Wild Life & Fisheries Bldg., 400 Royal St., New Orleans, La. Describes, in semi-humorous style, the culinary and nutritional attributes of the oyster and presents a number of recipes for preparing this gourmet's favorite.

Quality Determination of Mussels (MYTILUS EDULIS) and Oysters, by P. Korringa, Translation Series No. 76, 6 pp., illus., processed (Translated from *Archiv fur Fischeretwissenschaft*, vol. 6, no. 3/4, 1955, pp. 189-193.) Fisheries Research Board of Canada, Ottawa, Canada, 1956.

"Serological Studies on Relationships Among Oysters of Different Genus, Species, and Races," by Kenichi Numachi, article, *The Tohoku Journal of Agricultural Research*, vol. 10, no. 3, November 1959, pp. 313-319, illus., printed. The Faculty of Agriculture, Tohoku University, Sendai, Japan.

PEARL OYSTERS:

Survey of the Pearl Banks, Gulf of Mannar, 1955, by S. Sivalingam, Contribution No. 2, 19 pp., illus., pp. 308-325.) Fisheries Research Station, Colombo, Ceylon. Covers a survey of the Gulf of Mannar in

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1955 to ascertain the presence of pearl oysters, location, and extent of oyster beds. The survey also determined the age composition of oysters, size of population, and value of the oysters collected. This report is based on the results of dredging operations only.

PHILIPPINES:

Observations on Philippine Fisheries, by Ole J. Heggen, 27 pp., processed. International Cooperation Administration, U. S. Operations to the Philippines, Manila, Philippines.

PRESERVATION:

Fish Preservation Simplified, by H. van Pel, 22 pp., illus., printed. South Pacific Commission, Literature Bureau, Box 5254, G.P.O., Sydney, Australia.

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Delayed Mortality of Hatchery-Reared Rainbow Trout in Relation to Five Chemical Factors Encountered in Transporting Waters (Thesis of DeVon Wayne Linn for the M. S. Degree in Fisheries), 88 pp., illus., processed. Oregon State College, Corvallis, Oreg., June 1955.

REFRIGERATION:

Die Anwendung der Kalte in der Lebensmittelindustrie. Handbuch der Kältetechnik (Application of Refrigeration in the Food Industry. Handbuch der Refrigeration), 690 pp., illus., printed in German, D. M. 114 (about US\$27.14). Springer Verlag, Heidelberg Platz 3, Berlin, Germany, 1960. Includes a chapter on fish--physical properties, keeping fish fresh above their freezing point, sanitary requirements for ice, complementary losses, freezing, and freezing of fish and crustacea on board ship.

RHODESIA:

Proceedings of the First Fisheries Day in Southern Rhodesia (Salisbury, August 1957), 88 pp., illus., printed. Federal Ministry of Agriculture, Salisbury, Rhodesia, 1959.

SALMON:

Behavior of Chinook and Silver Salmon, by George H. Allen, Contribution No. 24, 6 pp., illus., printed. (Reprinted from Ecology, vol. 40, no. 1, January 1959, pp. 108-113.), University of Washington, School of Fisheries, Seattle, Wash.

Biochemical Analysis of Young Salmon at the Time of Their Transformation to a Condition Close to the Smolt State, and During Retention of Smolts in Fresh Water, by E. M. Malikova, Translation Series No. 232, 19 pp., processed. (Translated from Trudy L'vovskogo Otdeleniya VNIRO, vol. 2, 1957, pp. 241-255.) Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick, Canada.

An Examination of Factors Affecting the Abundance of Pink Salmon in the Fraser River, by E. H. Vernon, 52 pp., illus., processed. International Pacific Salmon Fisheries Commission, New Westminster, British Columbia, Canada, 1958.

Transformation to Smolt Stage and Downstream Migration of Young Salmon, by N. V. Evropeitseva, Translation Series No. 234, 36 pp., processed. (Translated from Uchenye Zapiski Leningradskovo

Gosudarstvennoye Universiteta (LGU), No. 228, Seriya Biologicheskikh Nauk No. 44, 1957, pp. 117-154.) Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick, Canada, 1959.

SARDINES:

"La Fabricacion de Conservas de Sardina con Pescado Congelado" (The Manufacture of Canned Sardines with Frozen Fish), article, Industria Conservera, vol. 26, no. 249, March 1960, pp. 70-72, printed in Spanish. Industria Conservera, Calle Marques de Valladares, 41, Vigo, Spain.

SCOTLAND:

"Results of Scottish Herring Fisheries in 1959 and Prospects for 1960," by B. B. Parrish and I. G. Baxter, article, Scottish Fisheries Bulletin, no. 13, June 1960, pp. 2-10, illus., printed. The Marine Laboratory, Department of Agriculture and Fisheries for Scotland, Victoria Road, Torry, Aberdeen, Scotland.

SEALS:

"Selfangsten 1959" (Seal Catch in 1959), by Sverre Mollestad, article, Fiskets Gang, vol. 46, no. 18, May 1960, pp. 261-266, printed in Norwegian. Fiskets Gang, Postgiro Nr. 691 81, Bergen, Norway.

SHELLS:

"Shell Take and Prices Down," article, Fisheries Newsletter, vol. 19, no. 5, May 1960, pp. 13, 27, printed. Commonwealth Director of Fisheries, Department of Primary Industry, Canberra, Australia. The decline in production and consequent drop in pearl shell prices during the past two years was due to the development of cheaper plastic button, competitive with the shell buttons, and also to unfavorable weather. The Australian government and the industry have attempted to promote the use of pearl shells by means of a joint sales campaign.

SHRIMP:

Aspects of the Biology of the Tortugas Pink Shrimp, PENAEUS DUORARUM, by Edwin S. Iversen and C. P. Idyll, Contribution No. 246, 8 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 89, no. 1, 1960.) The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla. On the Tortugas grounds, off southern Florida, biologists tagged shrimp with Petersen disc tags. A general tendency was noted for adult shrimp to move in a northwesterly direction. Females attain larger sizes than males and growth of the carapace, which is more easily measured than total length, is related linearly to total length. Size-frequency distributions suggest that small shrimp move from shallow water at the end of the Florida peninsula to the Tortugas grounds. Some salinity and temperature data are given.

"Shrimps: the U. S. Industry," by W. Adair Stewart, article, Foreign Trade, vol. 114, no. 2, July 16, 1960, pp. 15-16, printed. Queen's Printer, Government Printing Bureau, Ottawa, Canada. The author describes the commercial importance of the frozen shrimp industry in the United States, management and conservation of the shrimp fishery, the search for new fishing grounds, and potential sources of foreign supplies.

SPAIN:

"La Produccion Conservera Espanola en 1958" (Spanish Canning Production in 1958), article, Boletin de

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Informacion del Sindicato Nacional de la Pesca, no. 19, April 1960, pp. 10-11, printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6^a Planta, Madrid, Spain.

SPINY LOBSTERS:

Lobster Fishing in Ceylon, by G. H. P. DeBruin, Bulletin No. 9, 19 pp., illus., printed. The Fisheries Research Station, Department of Fisheries, Colombo, Ceylon, 1960. Spiny lobsters are present in Ceylon waters, according to the author, but an established fishery does not exist due partly to the absence of efficient methods of capture. Gear efficiency tests were therefore conducted using lobster traps such as the Scottish creel, Canadian "parlour and bed-room," and the Cornish "ink-well" in order to find an efficient method of capturing lobsters. The Canadian "parlour and bed-room" type constructed of steel and hemp netting proved to be the most effective trap. Diving operations revealed the existence of spiny lobsters on both the east and west coasts of Ceylon but for some unknown reason traps were ineffective on the east coast. On the west coast, however, experiments with traps showed the presence of lobsters in commercial quantities in rocky areas and coral reefs.

Production and Distribution of Larvae of the Spiny Lobster, PANULIRUS INTERRUPTUS (Randall) with Records on P. GRACILIS Streets, by Martin W. Johnson, 52 pp., illus., printed, \$1. (Reprinted from Bulletin of the Scripps Institution of Oceanography, vol. 7, no. 6, May 23, 1960, pp. 413-462.) University of California Press, Berkeley, Calif., 1960.

A study of the occurrence and distribution of the phyllosoma larvae of the spiny lobster. In this investigation the material consisted of phyllosoma larvae of Panulirus interruptus (and to a lesser extent of P. gracilis) sorted from a large number of plankton hauls taken with a 1-meter net, mainly along the coast of California and Baja California, by several vessels during all seasons over a period of seven years. Findings showed that: the height of the hatching season is August and September; only one brood is produced each year by the spawning female; the complete phyllosoma larval period is about 7-3/4 months; and recruitment of lobsters on the coast of California and Baja California must depend upon the development of large eddies, swirls, and counter-currents which retard the flushing out of larvae to the south with the California current.

STEELHEAD TROUT:

Factors influencing the Seaward Migration of Smolt Steelhead Trout, SALMO GAIARDNERII GAIARDNERII Richardson, in the Alsea River, Oregon. (Thesis of Rupert Earle Andrews for the M. S. Degree in Fish and Game Management), 99 pp., illus., processed. Oregon State College, Corvallis, Ore., October 1958.

TILAPIA:

"Tilapia," by William R. Heard, article, Alabama Conservation, vol. 31, no. 5, February-March 1960, pp. 7-8, 23-24, illus., printed. Alabama Department of Conservation, Union St. Administration Bldg., Montgomery, Ala. During the past two years, Tilapia nilotica or T. mossambica have been added to 11 of Alabama's state-owned and managed lakes in an attempt to evaluate their usefulness in supplement-

ing bream and bass fishing, and to determine their effectiveness in controlling obnoxious algae, Pithophora. To date, good catches of Tilapia have been taken from these lakes, although its effectiveness in controlling the algae is still in doubt.

TRANSPORTATION:

Fish Packing Boxes for Sea Transportation, by S. R. Suntur, 5 pp., illus., printed. (Reprinted from General Fisheries Council for the Mediterranean, Proceedings and Technical Papers, Technical Paper 64, no. 5, pp. 459-463.) General Fisheries Council for the Mediterranean, Food and Agriculture Organization of the United Nations, Rome, Italy, 1959.

TRAWL FISHING:

Forecasting the Stock Available and the Conditions for Trawl Fishing, by N. A. Maslov, Translation Series No. 220, 24 pp., processed. (Translated from Trudy Piliarnovo N.-I. Institut Morskovo Rybnovo Khoz-zaistva i Okeanografii (PINRO), no. 10, 1957, pp. 5-29.) Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick, Canada, 1959.

TRAWLERS:

Resistance and Propulsion of Trawlers, by D. J. Doust and T. P. O'Brien (paper read at the North East Coast Institution of Engineers and Shipbuilders, Bolbec Hall, Newcastle-upon-Tyne 1, England, April 3, 1959, 82 pp., printed), from Journal of the British Shipbuilding Research Association, 5 Chesterfield Gardens, Curzon St., London W1, England, 1959.

TRAWLING:

"Midwater Trawling," article, Trade News, vol. 12, no. 11, May 1960, pp. 9-12, illus., printed. Trade News, Department of Fisheries, Ottawa, Canada. Midwater trawling is a fishing method which is attracting widespread interest at the present time. Basically it is an old method that was not particularly satisfactory until new electronic devices were added after World War II. Over the past decade and especially within the past three years, improvements have been superimposed one upon another with remarkable rapidity both in northern Europe and in North America. Because scientists and technologists have shared their findings, representing one continuous development, and especially as one of the most important steps was taken in Canada and interesting practical experiments are still under way, it is proposed to outline these advances, beginning with this summary of early developments outside of Canada. This article; the first of a series of articles on developments in mid-water trawling, discusses the development of the Larsen two-boat trawl, designed primarily for the Danish herring fishery; the French "Exocet" trawl device; Finland's pair-trawling; the Phantom trawl designed by a Swedish naval architect; and the German trawl with four otter boards. It also discusses the modification of these methods of midwater trawling by other countries to fit their own particular needs.

TRAWLS:

"An Improved Design for Small Trawl Doors," by W. A. King-Webster, article, World Fishing, vol. 8, no. 1, January 1959, pp. 40-42, printed. World Fishing, John Trundel (Publishers) Ltd., Temple Chambers, Temple Ave., London EC4, England.

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

"Das Schwimm-Schleppnetz (The Floating Trawl), by A. von Brandt, article, Die Bundesanstalt für Fischerei, vol. 5, nos. 22/23, October 1958, pp. 201-226, illus., printed in German. Die Bundesanstalt für Fischerei, Neuer Wall 72, Hamburg 36, Germany.

TUNA:

"Trolling and Longlining for Tuna," by Louis Devambe, article, South Pacific Bulletin, vol. 10, no. 2, April 1960, pp. 32-33, illus., printed, 30 U. S. cents. South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. The French Institute of Oceania has published two illustrated booklets recording the results of experimental tuna fishing carried out by its fisheries research vessel Orsom III, over a period of several years. Two techniques for commercial use, trolling and longlining, were finally selected, and each is the subject of a separate report. Both are reviewed in the present article.

"Vers une Adaptation des Methodes de Prises aux Habitudes du Thon" (Towards an Adaptation of Catching Methods to the Habits of the Tuna), article, France Peche, vol. 5, no. 41, June 1960, pp. 21-22, illus., printed in French. France Peche, Tour Sud-Est, Rue de Guemene, Lorient, France.

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Fisheries Administration, Fisheries Division of FAO, and Bureau of Sport Fisheries and Wildlife.

VENEZUELA:

Activades Pesqueras en Venezuela en el Año 1957--Observaciones Generales de los Problemas Pesqueros Nacionales (Venezuelan Fishing Activities in 1957--General Observations of National Fishery Problems), 102 pp., illus., processed in Spanish. Ministerio de Agricultura y Cria, Direccion de Recursos Naturales Renovables, Division de Pesca y Caza, Caracas, Venezuela, May 1959.

VESSELS:

"Are 'Container' Fishing Vessels Practical?" by G. W. Lehmann, article, World Fishing, vol. 8, no. 4, April 1959, pp. 94-95, illus., printed. World Fishing, John Trundell (Publishers) Ltd., Temple Chambers, Temple Ave., London EC4, England. In a container fishing vessel, the movable containers are placed in the fish hold in such a way that they are filled on the fishing grounds with processed fish, and upon arrival at the home port they are immediately unloaded and distributed inland by truck or railroad car. As the containers remain open during the fishing period, a service alley between them must be provided and so arranged that the doors of the containers may be opened and closed leaving sufficient accessibility for loading. Such service alleys need hatches above them, located preferably forward. Containers are built with watertight openings in order to provide watertight buoyancy bodies within the space as a reserve buoyancy when a vessel is stricken in heavy weather. The fish space of a container fishing vessel need not be insulated since the containers themselves are. Each is equipped with a refrigerating unit, which is fed by the ship while at sea and connected to the truck on shore.

WALRUS:

Preliminary Investigation of the Atlantic Walrus, OOBENUS ROSMARUS ROSMARUS (Linnaeus), by Alan G. Loughrey, Wildlife Management Bulletin, series 1, no. 14, 127 pp., illus., processed. Department of Northern Affairs and National Resources, National Parks Branch, Canadian Wildlife Service, Ottawa, Canada, 1959.



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TECHNIQUE FOR MASS-MARKING FISH BY MEANS OF
COMPRESSED AIR

A promising new method for mass-marking fish has been developed. It obviates time-consuming individual handling. A luminous polystyrene ("Derbylite") is applied with sandblast and paint spray guns (using a pressure of 80 to 100 p.s.i.) to fish held in dip nets. The fluorescent fish are detectable under a vapor lamp. The lasting quality of the polystyrene is unknown, but according to the author all indications are that it is permanent. (A Technique for Mass-Marking by Means of Compressed Air, by C. F. Jackson, Technical Circular No. 17, New Hampshire Fish and Game Dept.)

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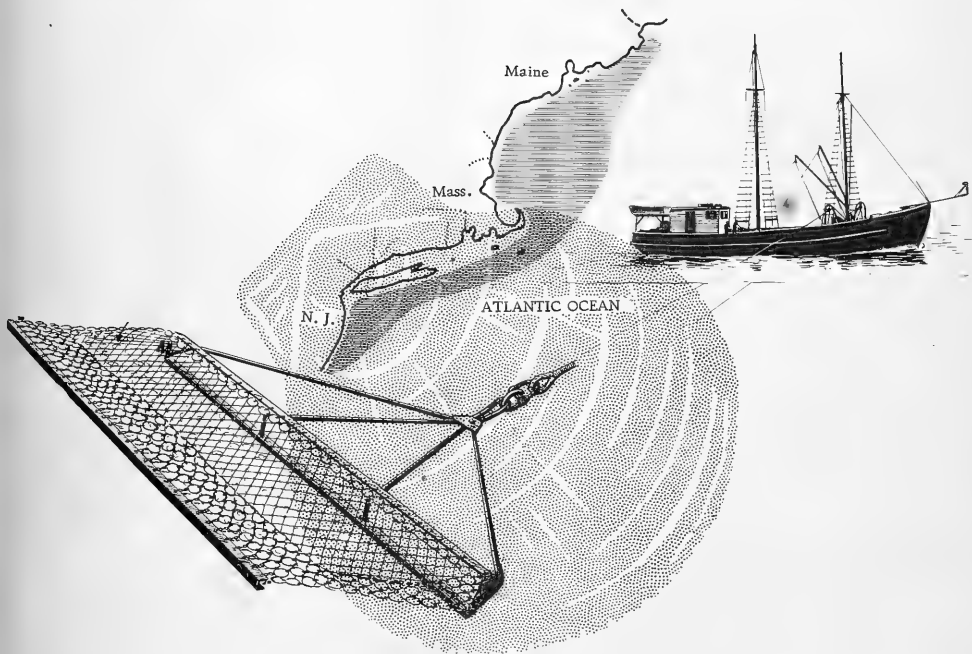






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COMMERCIAL FISHERIES REVIEW



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COMMERCIAL FISHERIES REVIEW



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

Joseph Pileggi, Editor
H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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5/31/63

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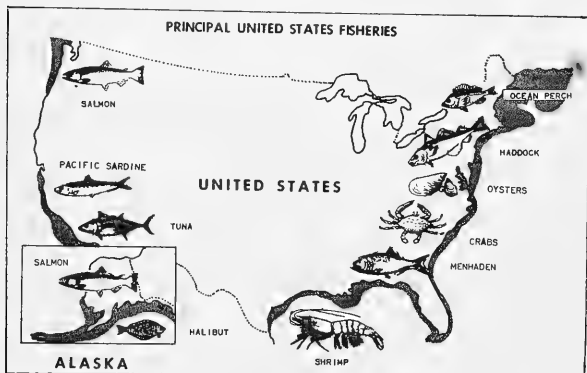
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A REVIEW OF THE ATLANTIC COAST WHITING FISHERY

By Raymond L. Fritz*

ABSTRACT

The annual landings of whiting or silver hake have increased slowly during the last 25 years, from a few pounds to well over 150 million pounds. Technological advances in processing, freezing, and transportation, as well as changes in fishing gear and grounds, have contributed to this increase. New methods of utilizing this species for animal food and industrial purposes have developed a stable demand and created an important fishery.

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INTRODUCTION

The whiting or silver hake (*Merluccius bilinearis*) (fig. 1) has always been abundant on the fishing grounds from Maine to Virginia. Prior to 1920, it was at times considered a nuisance by fishermen and landings amounted to less than 7 million pounds. Technological advances in handling fish, particularly quick-freezing and automatic scaling machines, in addi-

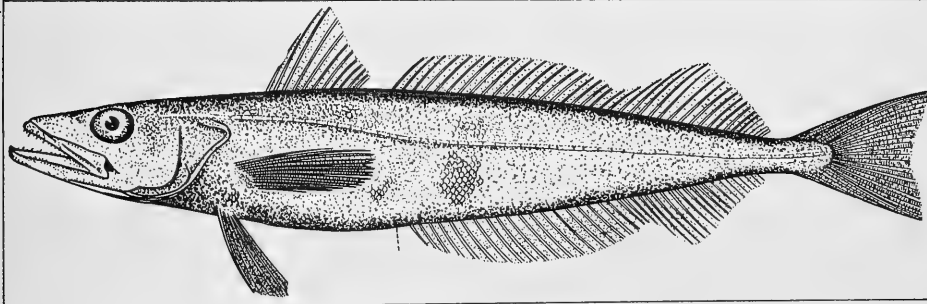


Fig. 1 - Whiting (*Merluccius bilinearis*).

*Fishery Research Biologist, Biological Laboratory, Division of Biological Research, U. S. Bureau of Commercial Fisheries, Woods Hole, Mass.

tion to the development of markets, stimulated rapid growth of the whiting fishery so that landings rose to 100 million pounds by 1949. Changes in fishing gear, fishing grounds, and utilization added more to the development of this fishery along the Atlantic Coast so that 1957 landings were about 170 million pounds.

Recognizing the need for an understanding of this important fishery, the Atlantic States Marine Fisheries Commission requested the U. S. Fish and Wildlife Service to study the fishery. The program was started in 1954 with funds made available under the Saltonstall-Kennedy Act.

HISTORICAL BACKGROUND: The whiting fishery had its beginning during the early 1840's. Storer (1867) states that some whiting was prepared for the market, but that generally it was not considered very good because it soon became soft and tasteless. Storer also reports that considerable numbers were caught with hook-and-line on Crab Ledge, a few miles from the Boston Lighthouse. He also relates that this species became a general nuisance to the fishermen at Provincetown, Mass., when large quantities were caught in the mackerel nets. Often, 8 to 10 hours were necessary to remove these fish from the nets. However, during September and October the whiting were useful as bait to catch dogfish. Storer (1867) and Nye (1886) reported that large numbers of whiting were stranded on the beach after chasing sand eels or other small fishes.

Very little was published on the whiting from 1900 through the 1920's. Bigelow and Welsh (1925) summarized what little was known of the life history at that time. This account was revised and brought up to date by Bigelow and Schroeder (1953).

GEOGRAPHICAL DISTRIBUTION: The general geographical distribution of the whiting is reported by Bigelow and Schroeder (1953) as the continental shelf of eastern North America, northward to the Newfoundland Banks and southward to the offing of South Carolina. Recently McKenzie and Scott (1956) reported several specimens from the Gulf of St. Lawrence, the northernmost record of this species. Although the range of this fish is extensive, the principal areas of commercial exploitation are along the inshore waters of the Middle and North Atlantic Coast and on Georges Bank.

Year	Maryland	Virginia	Totals		
			Chesapeake Bay		
		(1,000 Pounds)			
1957	49	19	68		
1956	33	48	81		
1955	-	45	45		
1954	27	34	61		
1953	3	34	37		
1952	1	13	14		
1951	11	17	28		
1950	3	8	11		
1949	3	3	6		
1948	8	34	42		
1947	1,986	112	2,098		
1946	680	303	983		
1945	567	188	755		
1944	145	136	281		
1943	-	-	-		
1942	6	452	458		
1941	-	-	-		
1940	6	247	253		
1939	1	71	72		
1938	-	140	140		
1937	-	17	17		
1936	-	-	-		
1935	-	16	16		
1934	-	5	5		
1933	-	-	-		
1932	-	-	-		
1931	-	-	-		

REGIONS

The Bureau collects and publishes monthly and yearly summaries^{1/} of United States fishery landings by regions. In this paper, data collected for the Chesapeake Bay, Middle Atlantic, and New England regions are examined and discussed. The data given in tables 1-8 come from various sections of the statistical reports.

CHESAPEAKE BAY: The southernmost commercial fishery for whiting is in the Chesapeake Bay region (fig. 2). The appearance of whiting there from year to year has been very erratic. Hildebrand and Schroeder (1928) reported that two pound nets located in Lynnhaven Roads, Va., from 1908 to 1923, caught a few whiting in some years but none in other years. Pearson (1932) listed the whiting with many other species caught in the winter trawl fishery off the North Carolina-Virginia coast during 1931. Records from 1934 through 1957 show further that the yearly landings have fluctuated considerably in that region (table 1). It can be seen that, during 1947, slightly over 2 million pounds were landed, the largest amount ever recorded from that region.

^{1/}Fishery Industries of the United States, 1932-1938, U. S. Department of Commerce, Bureau of Fisheries; and Statistical Digests No. 1-44, Fishery Statistics of the United States, 1939-1957, U. S. Department of the Interior, Fish and Wildlife Service.

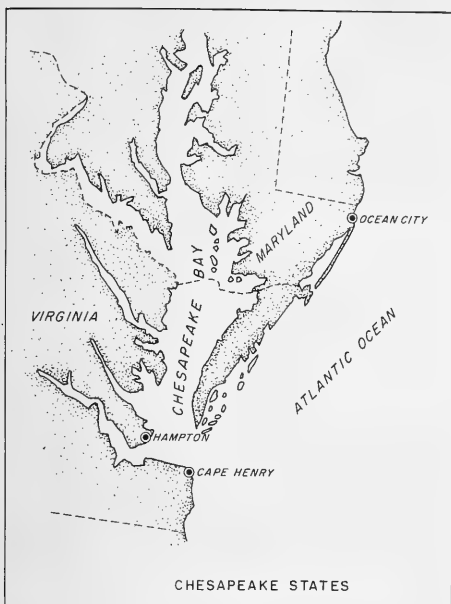


Fig. 2 - Chesapeake Bay States.

Whiting caught in that general region are landed at Ocean City, Md.; Hampton and Norfolk, Va.; and other smaller ports along the coast. Hildebrand and Schroeder (1928) state that the small local catch is easily disposed of in Norfolk markets, where it is known as "winter trout."

During the early years of the fishery in the region, the pound net was the principal gear used. June (1956) reports that during the 1920's there were 14 fishing companies which operated 45 pound nets in the vicinity of Ocean City, Md. Not a single pound net remains in that region today. Along with the decrease in pound nets there was an increase in the number of draggers operating on the grounds. During the past few years, the whiting landings in that region have been primarily from draggers.

MIDDLE ATLANTIC: The Middle Atlantic region includes Delaware, New Jersey, and New York (fig. 3). June and Reintjes (1957) reported that whiting was the predominant species caught by the inshore draggers during 1946 and 1947. In subsequent years,

however, they contributed very little to the over-all catch.

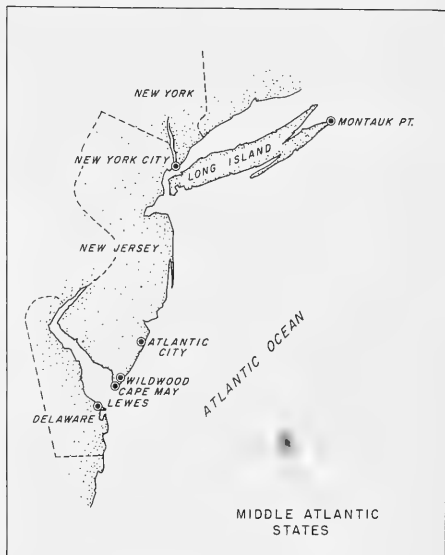


Fig. 3 - Middle Atlantic States.

Annual Landings: Annual landings of whiting in the Middle Atlantic region, 1931 through 1957, are shown in figure 4. It can be seen that the landings increased from 2.5 million pounds in 1931, to approximately 14 million pounds in 1937. From 1937 to 1947, the yearly landings averaged about 10 million pounds, then dropped to 1.5 million pounds in 1948. June and Reintjes (1957) reported that the decline from 1948 to 1951, as shown in figure 4, was associated with a decrease in abundance on

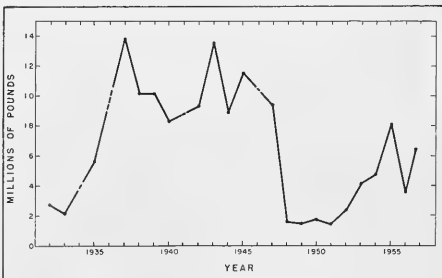


Fig. 4 - Total Middle Atlantic landings of whiting, 1931-1957

Table 2 - Annual Landings of Whiting in Middle Atlantic States, 1931-1957

Year	New York	New Jersey	Delaware	Totals
				Middle Atlantic
(1,000 Pounds)				
1957	3,653	2,887	-	6,540
1956	1,540	2,082	-	3,622
1955	3,800	4,300	-	8,100
1954	2,100	2,600	-	4,700
1953	1,400	2,700	-	4,100
1952	823	1,647	-	2,470
1951	684	897	-	1,581
1950	1,363	474	-	1,837
1949	999	579	-	1,578
1948	845	799	13	1,657
1947	1,265	8,156	204	9,625
1946	3,816	-	-	3,816
1945	2,354	9,236	21	11,611
1944	2,935	5,894	-	8,829
1943	5,921	7,583	-	13,504
1942	2,988	6,345	-	9,333
1941	-	-	-	-
1940	2,501	5,887	-	8,388
1939	4,079	6,839	-	10,918
1938	3,956	6,229	-	10,185
1937	5,189	8,624	-	13,813
1936	-	-	-	-
1935	2,284	3,340	5	5,629
1934	-	-	-	-
1933	106	2,041	-	2,147
1932	171	2,534	-	2,705
1931	326	2,408	-	2,734

the fishing grounds. However, since 1952 the annual landings have slowly recovered.

Landings by States: In table 2 the landings are tabulated for the states in the region from 1931 through 1957. Landings for the New Jersey area exceeded the New York landings for almost the entire period.

Ports: Along the Middle Atlantic Coast whiting are landed at such ports as Point Pleasant, Belmar, and Belford, N. J., and at New York City.

Fishing Grounds: Fishing in the region is generally from Long Island, N. Y., to Cape May, N. J. Pound nets are presently located north of Atlantic City, while most of the draggers fish in 20 to 50 fathoms of water between Manasquan and Sandy Hook.

Gear: Whiting are caught with otter trawls, pound nets, purse seines, gill nets, and line trawls, but the greatest quantities are taken by otter trawls and pound nets. An analysis of the landings by gear shows that the pound-net catches exceeded the otter-trawl

catches in New York from 1931 through 1934. However, from 1935 through 1957 the otter-trawl catches were larger than the pound nets. In New Jersey, the pound-net catches also exceeded the otter-trawl catches from 1931 through 1946, but from 1947 to 1957 the otter trawlers landed more whiting than the pound nets (table 3). June (1956) in his study of the pound-net fishery along the Middle Atlantic coast reports that the number of nets and the catch of this fishery has decreased considerably. He further states that the competition from the more efficient draggers and the decrease in abundance of many food fish are among the factors which have caused the decline of the pound-net fishery.

Utilization: Whiting are largely used for human consumption along the Middle Atlantic coast. With the large market available in New York City, the freshly-caught fish can be easily transported to that market in relatively short time. However, some of the whiting are sold directly to retail stores in the immediate area of landing.

Table 3 - Landings of Whiting in the Middle Atlantic Area by Gear from 1931 Through 1957

Year	New York				New Jersey			
	Otter Trawl	Pound Net	All Others	Total	Otter Trawl	Pound Net	All Others	Total
(1,000 Pounds)								
1957	3,653	-	-	3,653	2,709	290	6	3,005
1956	1,525	9	6	1,540	1,702	447	62	2,212
1955	3,818	35	5	3,858	3,085	1,148	106	4,339
1954	2,111	59	1	2,172	2,106	491	36	2,633
1953	1,425	43	-	1,468	1,359	1,262	132	2,753
1952	776	46	-	822	395	1,229	24	1,648
1951	648	36	-	684	347	550	-	897
1950	1,284	79	-	1,363	157	357	-	474
1949	886	112	-	999	225	354	-	579
1948	756	88	-	844	630	168	-	798
1947	1,134	131	-	1,265	6,365	1,784	7	8,156
1946	3,437	379	-	3,816	-	-	-	-
1945	1,868	486	-	2,354	3,376	5,843	17	9,236
1944	2,533	402	-	2,935	2,622	3,349	12	5,983
1943	5,115	806	-	5,921	2,571	4,947	65	7,583
1942	2,469	505	14	2,988	999	5,343	2	6,344
1941	-	-	-	-	-	-	-	-
1940	1,905	596	-	2,501	523	5,354	9	5,887
1939	3,472	604	2	4,079	354	6,483	2	6,839
1938	3,331	124	-	3,956	304	5,910	15	6,228
1937	4,884	305	-	5,189	376	8,243	4	8,624
1936	-	-	-	-	-	-	-	-
1935	2,020	264	-	2,284	286	3,051	3	3,340
1934	-	-	-	-	-	-	-	-
1933	-	-	-	-	-	-	-	-
1932	-	168	3	171	-	2,534	-	2,534
1931	-	326	-	326	3	2,404	-	2,408

NEW ENGLAND: The most productive region for the whiting fishery is located along the coasts of Maine, Massachusetts, Rhode Island, and Connecticut (fig. 5). The earliest report of commercial exploitation is described by Smith (1897). Large quantities of whiting were reported to be abundant every fall in Buzzards Bay, Mass., and captured at night with spears



Fig. 5 - New England States.

for home use and for sale in the New Bedford, Mass., market. Since that early beginning the gear used and the landings in the New England area have changed considerably.

Landings: The New England landings from 1931 through 1957 are shown in figure 6. Landings rose from 8 million pounds in 1931 to slightly over 170 million pounds in 1957. Peaks occurred in 1940, 1945, 1949, 1951,

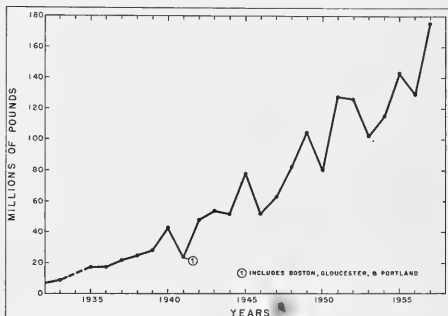


Fig. 6 - Annual landings of whiting from New England, including all types of utilization, 1931-1957.

and 1955, with a slight decrease following each of the peak years. Although fluctuations have occurred through the years, some more severe than others, the trend has been constantly upward.

Landings by States: Landings from 1931 through 1957 for the New England states are shown in table 4. Massachusetts led the other states in total landings with Maine, Rhode Island, and Connecticut following in that order. The expanded processing facilities and the abundance of the whiting along the Massachusetts coast has led to the development of the fishery in that State.

Table 4 - Annual Landings of Whiting in New England, 1931-1957					
Year	Maine	Massachusetts	Rhode Island	Connecticut	Totals
					New England
(1,000 Pounds)					
1957	15,810	107,777	2,291	237	126,115
1956	14,835	72,322	2,660	150	89,967
1955	25,128	81,884	3,200	361	110,573
1954	9,300	78,000	2,700	224	90,224
1953	12,600	71,800	704	135	85,239
1952	23,326	81,202	1,232	194	105,954
1951	19,576	97,974	742	174	118,466
1950	15,616	48,831	655	362	65,464
1949	12,580	75,776	660	1,020	90,036
1948	8,655	68,904	2,400	509	80,468
1947	6,015	52,591	2,134	911	61,651
1946	5,697	43,171	1,125	1,086	51,079
1945	5,289	68,577	2,907	891	77,664
1944	3,836	43,537	2,723	1,692	51,788
1943	1,962	46,498	4,051	1,487	53,998
1942	2,634	43,266	763	207	46,870
1941	-	-	-	-	-
1940	4,036	35,954	708	172	40,870
1939	4,046	23,493	251	265	28,055
1938	648	24,203	191	52	25,094
1937	-	21,036	1,017	425	22,478
1936	-	-	-	-	-
1935	13	15,418	1,955	30	17,416
1934	-	-	-	-	-
1933	-	8,678	725	17	9,420
1932	2	6,377	792	30	7,201
1931	6	6,930	1,005	129	8,070

Table 5 - Whiting Landings at Gloucester, Mass., Compared with Total Atlantic Landings, 1936-1957

Year	Gloucester	Atlantic Coast	Percent Landed
			at Gloucester
(1,000 Pounds)			
1957	77,620	132,846	58.4
1956	48,251	93,787	51.4
1955	59,526	118,872	50.1
1954	49,582	95,240	52.1
1953	41,158	89,622	45.9
1952	47,097	108,441	43.4
1951	51,491	120,075	42.9
1950	22,698	67,299	33.7
1949	30,881	91,618	33.7
1948	22,287	82,149	27.1
1947	14,894	73,479	20.3
1946	14,149	55,880	25.3
1945	27,864	90,009	30.9
1944	15,863	60,986	26.0
1943	22,430	67,502	33.2
1942	26,070	56,671	46.0
1941	12,724	No data	-
1940	8,285	49,609	16.7
1939	6,344	39,044	16.2
1938	2,620	35,419	7.4
1937	544	36,311	1.5
1936	4,375	No data	-

Ports: The principal whiting port for many years, especially since 1942, has been Gloucester, Mass. From 1942 through 1957, Gloucester processed from 21 to 58 percent of the total Atlantic coast whiting landings (table 5). Other ports in the New England region, particularly Rockland and Portland, Maine; Plymouth and Provincetown, Mass.; and Point Judith, R. I., also process whiting.

Fishing Areas: Whiting landed at the New England ports are taken from all of the statistical subareas shown in figure 7. Although some of the subareas are more productive than others, the amount of fishing effort expended in any given subarea is to some extent governed by the distance from home port. It is therefore possible that a productive subarea may be

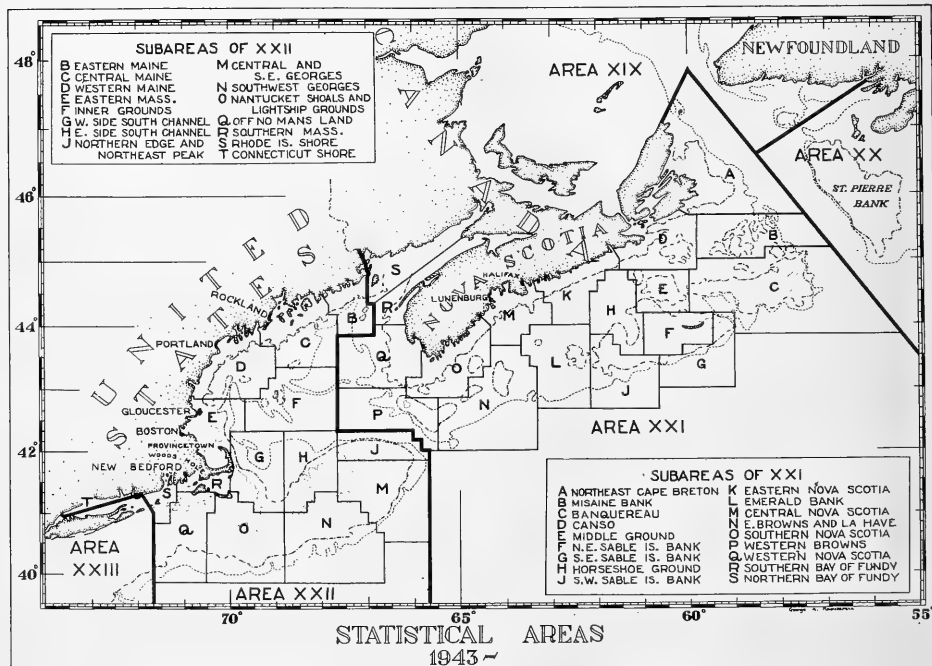


Fig. 7 - Statistical areas and subareas from Long Island, N. Y., to Newfoundland, Canada.

neglected for some time when closer fishing grounds are profitable. Landings from each of the subareas in areas XXI and XXII at certain New England ports for the years 1937 through 1957 are given in tables 6 and 7. Specific fishing grounds referred to will be defined in connection with the subarea under discussion.

AREA XXI: All Subareas: This area is located along the eastern shore of Nova Scotia. Annual landings varied from year to year, with an average catch of 53,000 pounds from 1937 to 1957. At the present time, there are no vessels either from the United States or Canada fishing in this area specifically for whiting. Whiting are caught incidentally by vessels fishing for other species, such as haddock, ocean perch, or cod.

AREA XXII: Subarea B: This subarea contributes very little to the landings. During the 20 years under consideration landings have not exceeded 79,000 pounds. In some years whiting have been caught in the weirs located along the Maine coast.

Table 6 - Whiting Landings by Subareas from Area XXI at Certain New England Ports^{1/}, 1937-1957

Year	Unit	Subareas													Totals				
		A	B	C	E	F	H	J	K	N	O	P	Q	R		L			
1957	Lbs.	-	-	-	-	-	300	-	950	-	-	-	-	-	-	-	-	-	3,933
%		-	-	-	-	-	20.3	-	24.7	-	-	-	-	-	-	-	-	-	100.0
1956	Lbs.	-	-	145	-	-	6,100	-	508	-	-	-	10.1	-	45.3	-	2,000	-	8,753
%		-	-	1.6	-	-	69.6	-	5.8	-	-	-	11.6	-	5.2	-	22.8	-	100.0
1955	Lbs.	-	-	-	-	-	-	-	-	-	-	3,000	4,000	-	-	-	-	-	7,000
%		-	-	-	-	-	-	-	-	-	-	42.8	57.1	-	-	-	-	-	100.0
1954	Lbs.	52,438	103,540	103,540	-	-	567	-	-	-	-	-	700	-	-	-	-	-	260,785
%		20.1	39.7	39.7	-	-	.217	-	-	-	-	-	.268	-	-	-	-	-	100.0
1953	Lbs.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
%		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	Lbs.	-	-	289,745	-	-	334	501	-	5,427	918	4,926	-	-	-	-	-	-	301,851
%		-	-	95.9	-	-	.110	.165	-	1.7	.304	1.6	-	-	-	-	-	-	100.0
1951	Lbs.	-	-	155,310	-	-	-	-	-	-	2,054	1,169	3,927	-	-	-	-	-	162,460
%		-	-	95.5	-	-	-	-	-	-	1.2	.719	2.4	-	-	-	-	-	100.0
1950	Lbs.	36,144	-	-	-	-	1,169	-	-	11,070	-	450	-	-	-	-	-	-	50,833
%		75.0	-	-	-	-	2.2	-	-	21.7	-	.88	-	-	-	-	-	-	100.0
1949	Lbs.	-	-	-	-	-	-	-	2,921	2,672	120	34.3	609	-	-	-	-	-	5,322
%		-	-	-	-	-	-	-	46.2	42.2	1.8	0.6	9.6	-	-	-	-	-	100.0
1948	Lbs.	-	-	307	-	-	-	-	511	-	4,509	-	-	-	-	-	-	-	5,327
%		-	-	5.7	-	-	-	-	9.5	-	84.6	-	-	-	-	-	-	-	100.0
1947	Lbs.	-	-	-	-	-	-	-	-	-	317	1,125	-	-	-	-	-	-	4,156
%		-	-	-	-	-	-	-	-	-	21.9	78.0	-	-	-	-	-	-	100.0
1946	Lbs.	-	-	-	4,156	-	-	-	-	-	-	-	-	-	-	-	-	-	4,142
%		-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0
1945	Lbs.	-	-	-	-	-	-	-	-	-	73,510	6,737	1,268	-	-	-	-	-	81,515
%		-	-	-	-	-	-	-	-	-	90.1	8.2	1.5	-	-	-	-	-	100.0
1944	Lbs.	-	-	-	-	-	175	-	-	-	813	-	380	-	-	-	-	-	1,368
%		-	-	-	-	-	12.7	-	-	-	59.4	-	27.7	-	-	-	-	-	100.0
1943	Lbs.	-	-	-	-	-	-	-	-	-	468	1,260	-	-	-	-	-	-	1,728
%		-	-	-	-	-	-	-	-	-	27.1	72.9	-	-	-	-	-	-	100.0
1942	Lbs.	-	-	-	-	-	-	-	-	250	-	-	-	-	-	-	-	-	250
%		-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	100.0
1941	Lbs.	-	-	-	-	-	-	-	-	-	1,530	-	-	-	-	-	-	-	1,530
%		-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	100.0
1940	Lbs.	-	-	-	-	-	-	-	-	-	3,192	420	-	-	-	-	-	-	3,612
%		-	-	-	-	-	-	-	-	-	88.3	11.6	-	-	-	-	-	-	100.0
1939	Lbs.	-	-	1,600	-	-	2,010	-	-	-	3,940	4,000	-	-	-	-	100	-	11,650
%		-	-	13.7	-	-	17.2	-	-	-	33.9	34.3	-	-	-	-	.85	-	100.0
1938	Lbs.	-	-	-	-	-	-	-	-	-	68,368	65,052	-	-	-	-	-	-	131,420
%		-	-	-	-	-	-	-	-	-	50.5	49.4	-	-	-	-	-	-	100.0
1937	Lbs.	-	-	-	2,200	-	1,500	-	-	280	-	2,490	-	-	-	-	-	-	6,470
%		-	-	-	34.0	-	23.1	-	-	4.3	-	38.4	-	-	-	-	-	-	100.0

^{1/}Portland, Maine; Gloucester, Boston, Cape Cod ports, New Bedford, Mass.; Point Judith, R. I.; and Stonington, Conn.Table 7 - Whiting Landings by Subareas from Area XXI at Certain New England Ports^{1/}, 1937-1957

Year	Unit	Subareas													Cape Cod Ports ^{2/}	New England Uncl.	Totals		
		B	C	D	E	F	G	H	J	M	N	O	Q	R				S	
1957	1,000 lbs.	-	1	18,062	50,173	291	20,354	34,811	21	1	1	4	7	27	2,291	-	-	-	126,044
%		-	.1	14.3	39.8	.2	16.1	27.6	-	-	-	-	-	1.8	-	-	-	-	100.0
1956	1,000 lbs.	-	1	15,397	28,313	33	17,423	27,789	-	-	-	45	133	7	2,810	-	-	-	89,951
%		-	.1	17.1	29.2	.0	19.4	30.9	-	-	-	5.1	14.9	0.8	3.1	-	-	-	100.0
1955	1,000 lbs.	-	-	26,248	32,661	211	14,333	27,359	280	1	-	-	237	66	3,618	-	-	-	107,014
%		-	-	26.4	30.5	.2	13.4	25.6	.3	-	-	2.2	0.6	3.4	-	-	-	-	100.0
1954	1,000 lbs.	1	-	10,711	53,544	61	17,817	111	2	-	-	68	-	3,017	-	-	-	-	85,352
%		1	-	12.5	62.7	.1	20.9	.1	.0	-	-	0.1	-	3.5	-	-	-	-	100.0
1953	1,000 lbs.	2	5	13,215	63,140	111	6,838	21	9	-	-	14	-	838	-	-	-	1,344	85,535
%		2	5	15.4	73.8	.1	8.0	-	1.1	-	-	0.2	-	1.0	-	-	-	1.6	100.0
1952	1,000 lbs.	-	105	29,995	51,327	236	2,551	94	5	1	1	2	9	1,427	14,387	34	-	-	100,174
%		-	1.1	29.5	51.2	2.2	2.5	0.9	.0	.0	.0	.0	.0	1.4	14.4	.0	-	-	100.0
1951	1,000 lbs.	8	267	23,440	54,429	312	8,972	165	7	-	-	2	-	917	18,554	44	-	-	107,117
%		8	2.6	21.9	50.9	.3	8.4	0.6	.1	-	-	.0	-	.8	17.3	.0	-	-	100.0
1950	1,000 lbs.	-	1	16,210	28,498	64	1,888	1	-	-	-	20	-	1,017	15,170	32	-	-	62,701
%		-	.1	25.9	45.4	.1	2.7	.0	-	-	-	0.3	-	1.6	24.2	.0	-	-	100.0
1949	1,000 lbs.	3	2	13,373	49,017	120	2,560	46	10	4	-	1	8	1,679	16,275	24	-	-	83,122
%		3	2	16.1	59.0	.1	3.1	0.6	1.1	0.5	-	0.1	0.1	2.0	19.6	.0	-	-	100.0
1948	1,000 lbs.	-	2	9,400	38,115	157	2,230	21	-	-	-	1	-	2,908	18,878	59	-	-	72,923
%		-	2	12.5	52.2	.2	2.9	.0	-	-	-	.0	-	3.9	25.9	.0	-	-	100.0
1947	1,000 lbs.	1	6	6,334	29,408	61	2,204	3	1	-	-	12	2	3,046	16,824	313	-	-	58,216
%		1	6	10.9	50.5	.1	3.8	0.0	.0	-	-	0.2	0.3	5.2	28.9	.5	-	-	100.0
1946	1,000 lbs.	22	-	2,185	23,735	18	1,239	6	-	-	-	2	6	2,213	16,035	35	-	-	45,486
%		22	-	4.8	52.3	.0	2.8	0.1	-	-	-	0.0	0.0	4.9	35.2	.1	-	-	100.0
1945	1,000 lbs.	9	142	3,591	36,333	11	2,416	26	5	7	-	21	49	19	3,800	-	-	-	4,681
%		9	14.2	7.0	71.1	.0	4.7	0.1	.0	.0	-	1.1	1.1	7.4	-	-	-	-	92.2
1944	1,000 lbs.	3	36	1,661	15,519	65	3,530	21	-	-	-	38	92	21	4,417	-	-	-	4,078
%		3	3.6	10.7	45.4	.2	11.9	.0	-	-	-	0.5	1.0	1.0	13.8	-	-	-	100.0
1943	1,000 lbs.	3	25	1,232	19,216	155	764	271	19	6	1	20	60	1	5,542	-	-	-	125
%		3	2.5	4.5	70.0	.6	2.8	9.9	1.2	.1	.0	2.2	0.6	0.0	20.2	-	-	-	5
1942	1,000 lbs.	4	93	1,180	25,680	138	684	25	12	1	-	19	8	-	971	-	-	-	300
%		4	0.9	4.6	86.3	.5	2.5	0.1	0.1	.0	-	0.1	0.0	-	3.4	-	-	-	1.9
1941	1,000 lbs.	-	108	2,446	16,875	238	2,623	60	1										

Subarea C: During the early years, 1938 to 1940, this subarea contributed slightly over 200,000 pounds to the total landings. However, from 1941 through 1957, landings fluctuated considerably reaching a peak of 267,000 pounds in 1951, and decreasing to 1,000 pounds in 1957.

Subarea D: The Isles of Shoals, Casco Bay, and Jeffreys Ledge are the principal fishing grounds in this subarea. Landings during the years 1938 to 1941, ranged from 1.3 million pounds to 3.2 million pounds. During the next 6 years the catch declined, but from 1948 through 1957, the catch increased, reaching an all-time high of 30 million pounds in 1952. These grounds largely support the whiting fleet from the principal Maine ports.

Subarea E: This subarea includes the most productive whiting fishing grounds along the New England coast, such as Ipswich Bay, Stellwagen Bank, and Cape Cod Bay. Vessels from Gloucester, Plymouth, Provincetown, and other Cape Cod ports, fish these grounds regularly. Annual landings from 1937 through 1957 rose from 5.5 million pounds to 54.4 million pounds and accounted for over 50 percent of the total New England landings from 1937 to 1954.

Subarea F: Cashes Ledge, Fippenies Ledge, and the deep water of the Gulf of Maine are the main fishing grounds in this subarea. From 1938 to 1957, annual landings amounted to less than 325,000 pounds. The landings indicate that the catch of whiting is incidental to the capture of other species, such as ocean perch or haddock.

Subarea G: From 1938 through 1957, this subarea contributed from 1 to 20 million pounds to the total landings. The major fishing grounds in this subarea are located along the outside of Cape Cod from Provincetown to Chatham.

Subarea H: This subarea is the major offshore fishing ground for whiting. Prior to 1955, a few vessels from the nearby ports fished this ground with little success. During 1955, large concentrations were found near the Cultivator Shoal and vessels, largely from Gloucester, began to fish this subarea intensively. Since then over 25 million pounds have been landed each year from this subarea.

Subarea S: Dragger from Rhode Island and Connecticut generally fish in this subarea. Landings have fluctuated from 240,000 pounds in 1938 to 5.5 million pounds in 1943. This was followed by a decrease to 850,000 pounds in 1953, and during the next 3 years the landings increased to 3 million pounds. A slight decrease of approximately 1 million pounds was recorded for the landings for 1957. This subarea is an important fishing ground for the growing industrial fishery located at Point Judith, R. I. These figures represent the landings for human consumption and do not include the landings for industrial use and animal food.

Subareas J, M, N, O, Q and R: The total landed averaged less than 23,000 pounds for all subareas combined. This small amount can be considered as incidental to the catch of other fishes.

Gear: Whiting are taken in pound nets, fyke nets, and floating traps, but the greatest quantities are taken by otter trawlers. A typical New England dragger (less than 50 gross tons) is shown in figure 8. These vessels usually fish the inshore waters along the coast, while the medium draggers (51 to 150 gross tons) fish both the inshore and offshore grounds. The trawls are of a conventional design with a small mesh netting, usually $2\frac{1}{2}$ inches stretched measure, or with a fine mesh liner in the cod end.

Landings by Gear: Total landings for the various types of gear from 1931 through 1957 are shown in table 8. It can be seen that the landings at the Maine ports have been largely from otter trawls, with a small amount from the other types of gear. Floating traps and pound nets accounted for more fish from 1931 through 1937 at the Massachusetts ports, but from 1938 on the landings from the otter trawl exceeded all other types of gear. A similar situation existed in the Rhode Island landings with the stationary gear catching larger quantities of whiting from 1931 through 1942, and the otter trawl exceeding all other types of gear after 1942. Landings at Connecticut ports are primarily from small draggers.



Fig. 8 - Small New England dragger.

Table 8 - Whiting Landings by State and Gear, 1931-1957

Year	Maine				Massachusetts				Rhode Island				Connecticut					
	Otter Trawl	Float Trap	Net	Other	Otter Trawl	Float Trap	Net	Other	Otter Trawl	Float Trap	Net	Other	Otter Trawl	Float Trap	Net	Other		
	(1,000 Pounds)																	
1957	15,909	-	-	-	15,809	107,573	262	80	19	107,934	1,969	322	-	2,291	237	-	-	237
1956	14,335	-	-	-	14,835	71,291	337	167	24	72,319	1,771	889	-	2,660	150	-	-	150
1955	25,071	-	-	57	25,128	81,068	248	465	103	81,884	2,891	366	-	3,257	381	-	-	381
1954	9,318	-	-	-	9,318	77,266	160	511	112	78,049	2,589	204	-	2,793	224	-	-	224
1953	12,658	-	-	-	9	12,667	89,813	212	1,354	199	71,858	567	156	-	703	134	-	134
1952	23,321	-	-	7	23,328	79,401	80	1,503	218	81,202	1,141	92	-	1,233	193	-	-	194
1951	19,575	-	-	1	19,576	97,015	89	745	125	97,974	644	98	-	742	174	-	-	174
1950	15,579	35	-	1	15,615	46,081	223	2,480	44	48,818	818	39	-	855	362	-	-	362
1949	12,558	-	-	23	12,581	75,162	133	356	124	75,775	595	64	-	659	1,019	-	-	1,019
1948	8,645	9	-	-	8,654	85,830	318	2,829	126	88,903	2,098	301	-	2,399	503	-	-	508
1947	5,966	-	-	19	6,015	50,663	478	1,861	98	52,900	2,033	101	-	2,134	504	-	-	511
1946	5,579	5	-	13	5,607	41,446	1,394	149	182	43,171	802	323	-	1,125	1,080	-	-	1,088
1945	5,282	-	-	6	5,288	83,607	1,744	3,088	138	88,577	2,421	487	-	2,908	885	-	-	891
1944	3,335	-	-	1	3,836	41,899	781	862	74	43,536	2,379	344	-	2,723	1,679	-	-	1,652
1943	1,948	11	-	3	1,962	44,785	423	1,004	286	46,498	3,171	880	-	4,051	1,468	-	-	1,487
1942	2,634	-	-	-	2,634	34,073	1,124	7,958	111	43,266	155	808	3	784	193	-	-	207
1941	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1940	4,034	2	-	-	4,036	24,337	1,378	6,668	650	36,053	75	813	14	708	169	-	-	171
1939	4,021	1	-	24	4,046	15,540	1,117	6,778	58	23,493	19	217	14	250	263	-	-	265
1938	625	-	-	23	648	12,202	1,858	10,981	54	24,203	63	118	10	191	53	-	-	55
1937	-	-	-	-	-	7,371	3,422	10,213	33	21,038	311	682	24	1,017	428	-	-	428
1936	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1935	-	12	-	-	12	2,439	2,435	10,522	22	15,418	-	442	1,176	336	1,954	-	-	30
1934	-	-	-	-	-	343	1,253	6,413	669	8,678	223	339	163	725	17	-	-	17
1933	-	-	-	-	-	2	132	1,079	4,578	588	6,377	205	536	51	782	29	-	29
1932	-	-	2	-	2	102	1,434	4,813	781	6,930	61	895	49	1,095	-	129	-	129
1931	-	6	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-

Utilization: Probably few other species are utilized in so many ways as the whiting of New England. This species is processed at ports for human consumption, animal food, and industrial use. Although accurate figures are not available for landings destined for animal

and industrial uses, estimates based on the percentage of whiting in the catch, show that the yearly landings for those purposes are increasing (see fig. 9).

Most of the whiting landed at New England ports is processed for human consumption. The promotion of whiting during the early 1920's as a food fish can be attributed, in part, to the development of the "hot-fish" shops in the St. Louis, Mo., area (Johnson 1932). More than one-fourth of the total supply from the East Coast was used in that city. The fish's excellent qualities and constant supply made the species the choice of the fried fish shops. Jarvis and Puncocar (1940) found that whiting was suitable for home canning.

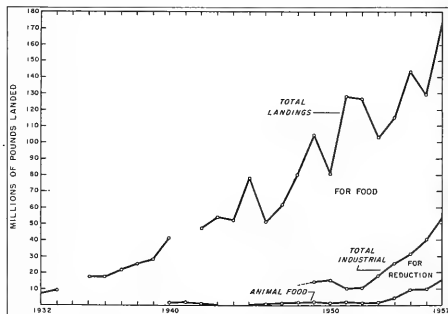


Fig. 9 - Annual New England landings of whiting, 1932-1957.

The development of efficient freezing units and rapid transportation further increased the demand for whiting, from the New England region, and now processing for human consumption has developed into an industry utilizing modern machines and assembly-line methods. The whiting are unloaded onto conveyors that feed to automatic scaling, washing, and heading machines. Trimming and loading of cartons or packages are done by hand. The cartons or packages are then machine-wrapped, frozen, and placed in cold storage for subsequent distribution.

Whiting are also prepared as mink food in several New England ports, among them New Bedford, Sandwich, and Provincetown, Mass. The fish are well-iced at sea in the round with the same care as if for human consumption. After the fish are unloaded, they are washed

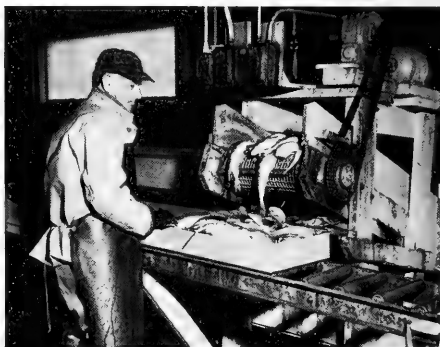


Fig. 10 - Loading whiting for mink food in 50-pound cartons.



Fig. 11 - Whiting frozen for mink food.



Fig. 12 - Fish being delivered to the dehydration plant for processing.

thoroughly and frozen immediately, usually in 50-pound cartons (figs. 10 and 11). The cartons of fish are then shipped to the various mink farms throughout the country.

The processing of fish into fish concentrates, fish meal, and oils for poultry and cattle feed supplements is a rapidly-growing industry. Dehydration or reduction plants are located in or nearby every New England fishing port (fig. 12). Sayles (1951) reported that 10.8 percent of the landings in the southern New England industrial fishery was composed of whiting. This species was ranked fourth in abundance. Recent analysis by Edwards and Lux (1958) of the industrial fishery revealed that whiting is the second most important species, following the red hake. Edwards (1958) computed that approximately 22 percent of the industrial landings at Gloucester, Mass., was composed of the whiting. This significant percentage demonstrates the importance of the species to the industrial fishery.

SUMMARY

The whiting fishery along the Atlantic coast from Maine to Virginia has undergone a number of changes during the past 25 years. In the early years, the fishery was principally an inshore operation with pound and trap nets. During the 1940's an increasing number of draggers began to fish exclusively for whiting along the entire coast. These vessels, being more efficient and versatile, began to land many more pounds of fish than the stationary gear. Changes in gear enabled the exploitation of many new fishing grounds in inshore waters as well as offshore. Along with changes in fishing methods, changes occurred in processing and distribution. The technological developments and improvements of handling and processing fish aided the New England fisheries to produce a better product and also expand the market to many parts of the country. New uses for the whiting in the industrial and animal food market has increased the value of the species. It is evident that the species does and will continue to play an important role in the economy of the New England fishing ports.

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RAPID OBJECTIVE FRESHNESS TEST FOR BLUE-CRAB MEAT AND OBSERVATIONS ON SPOILAGE CHARACTERISTICS

By Caroline H. Kurtzman* and Donald G. Snyder*

ABSTRACT

The Picric Acid Turbidity test, reported earlier for use with shrimp, has been found to be satisfactory, with one modification, for use as a rapid, objective freshness test for various commercial styles of blue-crab meat held under different conditions of storage and picked from steamed or boiled crabs. This test permits identification of blue-crab meat of fair or better quality and identification of crab meat of borderline or poorer quality. Data obtained in these studies gave an indication of the spoilage characteristics of the crab.

INTRODUCTION

No satisfactory objective test has been described to evaluate the freshness of processed meat of blue crab (*Callinectes sapidus*). Benarde (1958) reported that although it has generally been accepted that measurements of changes in pH and in bacterial populations could probably be used as indices of quality of blue-crab meat, he found that the changes in pH during spoilage were erratic and that the measurements of total bacterial populations were variable and unrelated to organoleptic indications of spoilage. Thus, neither pH nor bacterial counts can be considered suitable for evaluating the freshness of the product.



Fig. 1 - Picking crabs in a plant on the eastern shore of Maryland.

It would be desirable, however, if a quick and easily-conducted objective freshness test for blue-crab meat were available, since the meat is a perishable, premium product. This test would permit more efficient marketing in that the consumer need not accept claims of freshness on mere faith, and the producer selling a high-quality, fresh crab meat could furnish objective proof of that fact and benefit accordingly. A freshness test, termed the Picric Acid Turbidity test (PAT test), has been developed and shown to be satisfactory for use with iced shrimp (Kurtzman and Snyder 1960). It was felt that this test, or a modification of it, might also prove useful with blue crab, for both crab and shrimp are crustacea, and the meat of each may spoil similarly.

In commercial production, blue crabs are processed by either steaming or boiling, and three styles of meat are produced; lump, regular, and claw. In practice these products generally are held in ice-storage. However, deviations from this do occur, and may result in varying spoilage characteristics. Very little, however, has been reported on this subject.

The purposes of the present study therefore were:

1. To determine the suitability of a modified PAT test for use in assessing the quality of processed meat of blue crabby comparing both the PAT test and a sensory test in the evaluation.

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ation of the freshness of lump, regular, and claw meat processed by steaming or boiling and held under various conditions of storage.

2. To observe the spoilage characteristics of the various styles processed by steaming or boiling and held under various conditions of storage.

EXPERIMENTAL

Samples: Four lots of crab meat (A, B, C, and D) were obtained from a processing plant at Cambridge, Md. These lots were processed similarly. The crabs of each lot were divided into two groups according to the method used in cooking them: (1) steamed and (2) boiled.

1. **Steamed:** The crabs were steamed for 10 minutes at 15 pounds pressure on the same day that they were caught and were allowed to cool overnight at room temperature. They were

Sample Designation	Process	Style	No. of 1-Lb. Cans
SL	Steamed	Lump	4
SR	Steamed	Regular	4
SC	Steamed	Claw	4
BL	Boiled	Lump	4
BR	Boiled	Regular	4
BC	Boiled	Claw	4

four cans were mixed thoroughly in a sterilized container to obtain homogeneity and were then repacked into the same four 1-pound cans.

2. **Boiled:** The crabs were boiled for 15 minutes in tap water. In every other respect they were treated in the same manner as were the steamed crabs.

Data on the six samples of each lot thus obtained are summarized in table 1.

The four lots (A, B, C, and D) were treated differently only in respect to holding conditions maintained during testing. Lot A cans were packed in ice and held at 34° F. in a refrigerator; lot B cans were packed in ice and held at room temperature; lot C cans were held in an incubator at 40° F. without ice; and lot D cans were also held in an incubator at 40° F. without ice. (This easily-controlled condition of storage used with lot C was duplicated in lot D to obtain an indication of possible prestorage variation in quality of the commercial packs of crab meat.)

Lot	Storage Treatment
A	Packed in ice and held at 34° F. in a refrigerator.
B	Packed in ice and held at room temperature.
C	Held without ice in an incubator at 40° F.
D	Held without ice in an incubator at 40° F.

Data on the storage conditions used with the four lots are summarized in table 2.

Picric Acid Turbidity Test: Two 25-gram aliquots were removed daily from each of the 24 samples (4 lots; 6 samples per lot). Each aliquot was macerated about 20 seconds in a mechanical blender with 100 milliliters of 70-percent ethanol. Then 25 milliliters of saturated aqueous picric acid solution was added and the mixture was reblended for about 10 seconds. The resultant slurry was filtered through Whatman No. 41 filter paper. Approximately 10 milliliters of filtrate was collected to which was added one milliliter of 5 N hydrochloric acid. The turbidity of this solution was measured using a Klett-Summerson photoelectric colorimeter with a green filter (540 millimicrons)1/.

Sensory Test: A panel composed of five members rated the crab meat on the basis of flavor and odor. Since texture and appearance may be affected by factors other than spoil-1/ This procedure is the same as that used with the shrimp except that hydrochloric acid was not added to the filtrate from the shrimp meat. Without the addition of the acid, little turbidity was obtained when the crab meat of the regular pack was tested. It may be that liver tissue (commonly misnamed "fat") that is distributed throughout the regular pack, may be interfering with the formation of the turbid material. However, this modification permitted good results to be obtained when testing the meat of the regular pack, and did not adversely affect the results obtained when testing meat of the lump or claw packs.

Table 3 - System of Rating Used in the Sensory Test

Numerical	Rating		Definition of Rating as Applied to Blue-Crab Meat
		Descriptive	
5	High		Delicate flavor; sweet
4	Good		Loss of sweetness; no detection of any off-flavor or odors
3	Fair		Detection of slight off-flavors or odors
2	Borderline		Noticeable off-flavors or odors, but still edible
1	Inedible		Strong or offensive off-flavors or odors

age, these attributes were not considered in the judging. The rating system used by the panel is given in table 3. Arbitrarily, it was decided that an average daily value of 5.0 (requiring a perfect panel score) indicates crab meat of high quality; 4.0 to 4.9, good quality; 3.0 to 3.9, fair quality; 2.0 to 2.9, borderline quality; and 1.0 to 1.9, inedible quality.

RESULTS AND DISCUSSIONS

Visually, the filtrates obtained appeared clear when instrument readings were 30 or less and appeared increasingly turbid as the readings became higher. The time required to conduct an analysis was less than 5 minutes.

Colorimeter readings (turbidity values) and sensory evaluations for each lot of the crab meat processed by steaming are presented in figure 1; similar data for the crab meat processed by boiling are presented in figure 2. Actual values from duplicate samples agreed very closely on any given day. This tendency was not observed in the earlier study on iced shrimp except when the shrimp were quite fresh.

When the samples of crab were of fair quality or better, turbidity values obtained when testing lump meat were less than 35 (very slightly turbid), when testing regular meat were less than 40 (also very slightly turbid), and when testing claw meat were less than 25 (clear). Thus, values of 35, 40, and 25 (or less in each case) for lump, regular, and claw meat, respectively, indicate crab of fair or better quality. Turbidity values above 35 for lump, 45 for regular, and 25 for claw meat indicate crab of borderline or lower quality. There was only one exception: turbidity values above 40 were not obtained until 1 day after a sensory indication of borderline quality with the sample SR of lot D.

It is interesting that in the earlier studies with iced shrimp, turbidity values increased above 30 during the time that the organoleptic tests were still indicating the shrimp to be of fair quality.

Comparing figures 1a with 2a, 1b with 2b, and 1c with 2c indicates there was no consistent differences in the pattern of spoilage attributable to the type of processing utilized. The meat seemed to hold equally well whether the crabs were steamed or boiled.

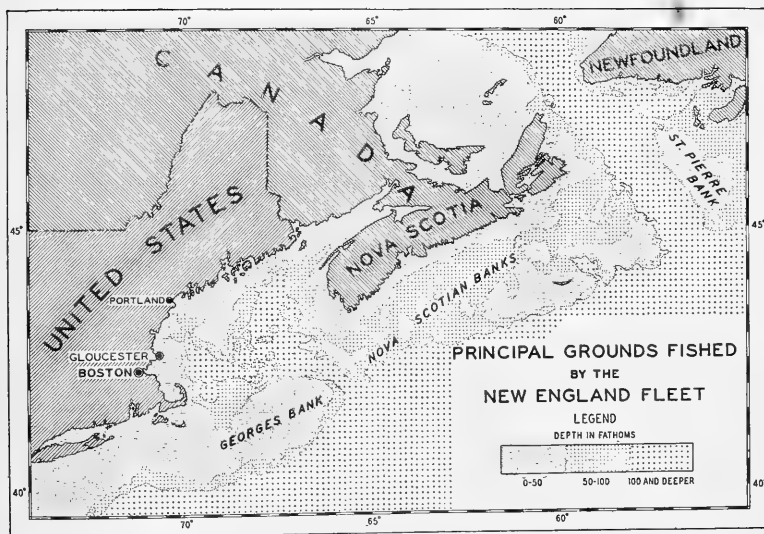
Comparing data obtained on all variables of lots C and D indicates that lot C was of higher initial quality than was lot D. These two lots were held at the same temperature (40° F.), yet the meat of lot C spoiled sooner than did that of lot D. This observation suggests that initial quality of fresh crab meat as determined by sensory evaluation is not necessarily an indication of its keeping quality. It may be that the meat preferred by the panel was more heavily contaminated during picking and thus spoiled more rapidly, or it may even be that the original preference for any one fresh meat over another might actually have been due to desirable flavors imparted as a result of particular bacterial flora.

In the present study, flavor and odor changes during spoilage were quite different for lump, regular, and claw meat. The different sensations experienced by the panel made it seem to them that entirely unrelated products were being tested. Their reactions are understandable, however, since the muscle tissues of the claw actually are different both in appearance and in texture from the muscle tissues of the body of the crab, from which both regular and lump meat are picked. Benarde (1958) reported that the yearly mean pH of fresh lump meat is 7.65, of regular meat is 7.8, and of claw meat is 8.3; thus, it would seem likely that a different bacterial flora would grow optimumly in each of the meats and that the meats would therefore spoil differently. Also, the presence of liver tissue mixed in the regular meat may be another reason for a different sensation obtained when the regular meat is tasted, since there is very little liver, if any, present in lump meat, and none present in claw meat. In general, the claw meat maintained good quality longer than did either lump meat or regular meat, both of which spoiled at similar rates.

CONCLUSIONS

Results obtained from this study indicate that the Picric Acid Turbidity test reported earlier for use with shrimp is satisfactory, with one modification, as a rapid, objective freshness test to identify blue-crab meat of fair or better quality and blue-crab meat of borderline or poorer quality. A colorimeter probably would be necessary for the practical application of this test, at least with lump meat and regular meat.

Observations of the spoilage characteristics indicate that there is no consistent difference whether steaming or boiling is used in processing and that the initial quality of fresh blue crab as determined by sensory evaluation is not necessarily an indication of its keeping quality. Also, it was observed that flavor and odor changes during spoilage are quite different for lump, regular, and claw meat and that the claw meat maintained good quality longer during storage than did either lump or regular meat, which spoiled at similar rates.





TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 5-- SINK GILL-NET FISHING IN NEW ENGLAND:

What was at one time a thriving gill-net fishery, based principally at Gloucester, Mass., now only shadows its former importance. The Gloucester gill-net fishing fleet has been reduced from over 50 vessels earlier in the century to only 3 at present (1960). Fishing is done during the spring and fall

months. The period extending from mid-June through mid-September is not utilized by the gill netters--partly because of the large numbers of dogfish that are present at that time. Cod (*Gadus morhua*), pollock (*Polachius virens*), and haddock (*Melanogrammus aeglefinus*) are included among the species most commonly caught.

The following pictorial presentation of the sink gill-net fishery is a brief attempt to document the fishery as it exists today.



Fig. 1 - The *Phyllis A.*, a 55-foot Gloucester vessel engaged in the sink gill-net fishery. The vessels in this fishery vary in length from 55 to approximately 75 feet. Practically all of the fishing takes place within a 30-mile radius of Gloucester.



Fig. 2 - Cod being hauled aboard over the fairlead drum. The crewman is one of five aboard the vessel. Hauling of the gear is usually started at daybreak and takes 2 to 3 hours.



Fig. 3 - Power is supplied to the net-lifter rotor, pictured here, by a small gasoline engine. The fisherman in the foreground is helping to free the gill net from the pawls which grip the net as it comes around the rotor.



Fig. 4 - Large cod being cleared from emmeshing twine by a crewman. The net-hauling operation is continuous, with the net coming aboard over the port side of the vessel. The fish are cleared from the webbing, and temporarily stowed in the hold, and the gill nets are placed in boxes for further clearing and repairing ashore.



Fig. 5 - Boxes of gill nets being prepared for setting over the stern of the *Phyllis A*. The setting of the string of nets, which in this case consists of 14 boxes, is done with the vessel proceeding at approximately 6 to 8 knots. A string of gear may stretch 3 to 4 miles over the bottom. The site at which the set is made is chosen on the basis of daily catches and previous experience. Sink gill nets are often fished over hard or rock bottom where trawling is not practicable and in depths of 20 to 40 fathoms.



Fig. 6 - After the first string of gear has been taken aboard the vessel, another string is set. The catch of fish from the first string is then forked from the hold of the vessel to the deck for dressing. Daily catches--usually consisting principally of cod, pollock, and haddock--range from about 1,500 to 5,000 pounds.



Fig. 7 - All fish are eviscerated and the larger fish are beheaded prior to landing. The fish are landed in top condition, usually less than six hours after they are brought on deck.



Fig. 9 - After arrival in port, the nets are unloaded from the vessel for inspection and drying ashore.

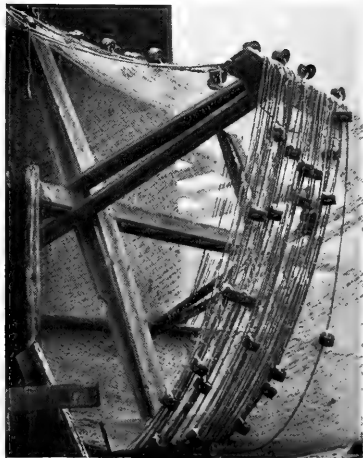
Fig. 11 - One section of the net on a rack. Twine is mostly 6-inch stretched mesh. Plastic floats are used on the float line and hammered leads on the lead line.



Fig. 8 - A gull gets "his share" as the catch is dressed while the Phyllis A. steams back to Gloucester.



Fig. 10 - The sections of gill net are placed on racks for drying and mending, if needed. Three "sets" (strings) of gear are required-- one ashore, one fishing, and the third aboard the boat.



LITERATURE CITED

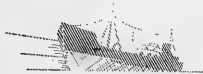
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--By Warren F. Rathjen,
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Gloucester, Mass.



Alaska Exploratory Fishery Program

COMMERCIAL POTENTIAL OF BOTTOM FISH IN SOUTHEASTERN ALASKA STUDIED:

M/V "New Hope" Cruise 60-1: The U. S. Bureau of Commercial Fisheries chartered vessel New Hope was expected to depart from Ketchikan, Sept. 6, 1960, for 6 weeks of exploratory bottom trawling west of Prince of Wales Island in Southeastern Alaska from Cape Muzon to Cape Ommaney. This is the first of a series of cruises under a new program initiated by the Bureau to assist in the development of Alaska's fishery resource.

The purpose of the cruise was to evaluate the commercial potential of bottom fish during a specific late summer period. Earlier cruises in 1956 and 1957 furnished basic topography data and exploratory fishing data for early spring and late fall seasons.

Records were to be maintained on certain meteorological and oceanographic data. Lengths and weights of important commercial species were to be logged and fishing locations charted.

A standard 400-mesh "eastern" otter trawl (commonly used on the West Coast) was to be fished as in a typical commercial fishing operation.



American Fisheries Advisory Committee

FIVE MAJOR PROBLEMS DISCUSSED AT AUGUST MEETING:

Five major problems pertaining to the Nation's commercial fisheries were discussed

at a meeting of the American Fisheries Advisory Committee. The meeting, eleventh of the group, was held in Seattle, Wash., in August 1960, the U. S. Bureau of Commercial Fisheries reported on September 22, 1960.

The major problems were:

(1) The actual and potential effect of foreign fishing activities in the eastern part of the Bering Sea on the United States fishery.

(2) The effects of territorial sea adjustments on the fisheries of the Pacific Northwest area.

(3) The increasing impact of dams and other multiple water-use projects upon the commercial fisheries.

(4) A review of legislation introduced in the 86th Congress to modify the Saltonstall-Kennedy Act, which is an act designed to aid the domestic commercial fishing industry to meet its problems in the biological, technological, and marketing fields.

(5) A discussion of the relative balance achieved by the Bureau of Commercial Fisheries in its allocations of Saltonstall-Kennedy funds to various activities and programs designed to help the fishing industry help itself, but with emphasis on the marketing activities of the Bureau.

The Committee expressed growing and continuing concern over the increased foreign fishing activities in the Eastern Bering Sea and urged the Bureau of Commercial Fisheries to consider the possibilities of overexploitation and the resultant potential depletion of fish stocks.

Inquiries were made relative to the extent of present American fishing operations in the area, the possible short- and long-range effects of foreign fishing activities on the historic fishing rights of United States citizens, and the potential areas of disagreement between the United States and foreign governments in the future.

The Committee also urged the Bureau to secure all possible data relative to the species and the amounts harvested and to particularly guard against any encroachment on the halibut grounds farther to the south which have been historically harvested on a sustained

yield basis by United States and Canadian fishermen under joint conservation policies.

In regard to territorial waters problems, the Committee recommended that since there was no agreement reached at the last International Conference on the Law of the Sea on fishing rights, the United States should stay with its original position of holding to the three-mile limit.

The Committee also suggested that consideration should be given to bilateral or multilateral agreements with foreign nations relative to the utilization of fishery resources off foreign shores.

The Committee placed emphasis on the value of research and recommended continued research on alternate methods of replacing lost or downgraded salmon spawning areas resulting from multiple water-use projects.

The Committee questioned the desirability of recent Congressional legislation proposing the apportionment of Saltonstall-Kennedy funds to state conservation agencies, educational institutions, and private research organizations, expressing the belief that the present contract program of the Bureau of Commercial Fisheries was more desirable from the standpoint of greatest immediate benefit to the industry and public.

In the discussions concerning allocations of funds to various Bureau activities and work areas, the Committee stated that, within the present framework of financial support from Saltonstall-Kennedy funds, it was their view that a proper balance has been achieved in the allocation of the Saltonstall-Kennedy funds.

Note: Also see *Commercial Fisheries Review*, May 1960 p. 14.



American Samoa

TUNA LANDINGS, AUGUST 1960:

In August 1960, tuna landings by Japanese and South Korean vessels fishing for the tuna cannery in American Samoa totaled 2.7 million pounds--an increase of 27.8 percent as compared with the 2.1 million pounds landed in August 1959. Landings for January-August 1960 of 18.1 million pounds were 6.6 percent higher than the 17.0 million pounds landed during the first eight months of 1959.

American Samoa Tuna Landings, August 1960				
Species	August		Jan.-Aug.	
	1960	1959	1960	1959
	(1,000 Lbs.)			
Albacore	2,439	1,921	15,094	13,207
Yellowfin	260	207	1,861	3,109
Big-eyed	43	13	1,155	685
Skipjack		4	10	4
Total	2,742	2,145	18,120	17,005

Note: Majority of the tuna was landed by Japanese long-line vessels; a small amount was landed by a South Korean long-line vessel.



Byproducts

U. S. PRODUCTION AND IMPORTS OF FISH MEAL AND SOLUBLES, JANUARY-JULY 1960:

During the first seven months of 1960, the United States production of fish meal reported to the U. S. Bureau of Commercial Fisheries amounted to 130,443 short tons as compared with 144,770 tons produced by the same firms in January-July last year. Imports of 79,506 tons for the same period were down sharply from the 105,004 tons imported in January-July 1959.

Table 1 - U. S. Supply of Fish Meal and Solubles, 1960 and 1959

Item	January-July		Total 1959
	1960	1959	
	(Tons)		
FISH MEAL			
<u>Domestic production:</u>			
Menhaden	105,246	113,104	223,893
Tuna and mackerel	13,303	12,630	25,380
Herring, Alaska	3,040	5,791	8,094
Other	8,854	13,245	26,184
Total production	1/130,443	1/144,770	306,551
<u>Imports:</u>			
Canada	24,421	32,089	39,033
Peru	40,739	37,488	49,923
Chile	9,113	4,995	5,104
Angola		20,738	20,738
Union of South Africa	4,930	3,374	9,727
Other Countries	303	6,320	8,400
Total imports	79,506	105,004	132,925
Fish meal supply	209,949	249,774	439,476
FISH SOLUBLES (wet weight)			
<u>Domestic production 2/</u>			
	54,647	89,051	165,359
<u>Imports:</u>			
Canada	691	1,243	1,660
Denmark	1,838	10,307	18,723
Other Countries	65	3,213	6,247
Total imports	2,614	14,763	26,630
Fish solubles supply	57,261	103,814	191,989

1/Based on reports from firms which accounted for 92 percent of the 1959 production.

2/Includes production of homogenized-condensed fish.

Similar declines occurred in the domestic production and imports of fish solubles. The January-July production of solubles of 54,647 tons was 34,404 tons less than for the same period the previous year. Imports of solubles during the first seven months of 1960 amounted to 2,614 tons as compared with 14,763 tons in the same period of 1959.



California

AERIAL CENSUS OF SEA LIONS:

Airplane Spotting Flight 60-13-Sea Lion Census: An aerial survey of the coast and offshore islands from the Oregon border to Pt. Conception was conducted by the California Department of Fish and Game Twin Beechcraft on June 8-9 and 13-15, 1960, to estimate abundance of sea lions in California.

During the five flights made along the Northern California coast, concentrations of sea lions were found on St. George Reef Islands, Sugar Loaf

off Cape Mendocino, Sea Lion Rock off the Mattole River, Fort Ross Reef, Point Reyes, the Farallon Islands, Ano Nuevo, Santa Cruz Point, Point Lobos, Partington Point, and Point Sal. Individuals and small numbers were found intermittently between those places.

Unfavorable weather conditions hampered the census operations, with coastal fog prevailing during June causing delays and interruptions to the flight. Photographs of concentrations of sea lions were taken at areas where significant numbers of animals were encountered. Combined with this were actual counts and estimates made at other areas where it was not worthwhile to make photographs.

Photographic equipment used included a 9" x 9" vertical aerial camera with 12" cone mounted in the plane, a K20 manual-operated aerial camera, and a 35-mm. color camera.

Estimates of the Southern California population have been postponed. Poor flying conditions combined with other aircraft commitments extended the operation beyond the allotted flight schedule.

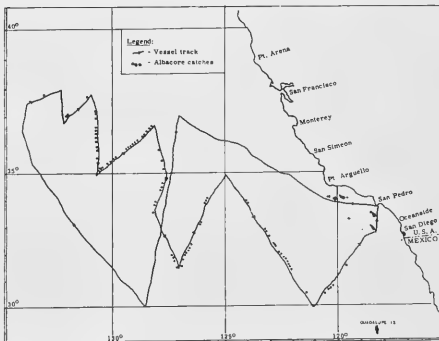
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ALBACORE TUNA MIGRATION OFF PACIFIC COAST STUDIED:

M/V "N. B. Scofield" Cruise 60S3-Albacore: The high seas area off California and Baja California within the latitudes 30° N. and 38° N. and inshore from 134° W. longitude were surveyed by the California Department of Fish and Game research vessel N. B. Scofield from May 23-June 18, 1960. The objectives were: (1) to explore the offshore area prior to the commercial albacore season in an attempt to intercept and determine the migration route or routes of albacore schools approaching the Pacific Coast; (2) to tag and release albacore; and (3) to gather biological and oceanographic data.

Most of the 3,000-mile survey track was scouted during daylight hours using surface trolling gear.

The first albacore were taken on June 4 approximately 500 miles west of San Francisco (latitude 37° 43' N., longitude 132° 45'



M/V N. B. Scofield Cruise 60S3-Albacore (May 23-June 18, 1960).

W.). Subsequent catches of 1 to 26 fish were made each day while running a southeasterly pattern toward the coast. The total catch was 154 albacore.

The majority (90 percent) of the fish averaged about 12 pounds each. Most of the rest were larger fish ranging from about 18 to 30 pounds, and were caught primarily in the southeastern portion of the survey area.

Stomachs of untagged fish showed no evidence of recent heavy feeding. Among the more common organisms observed were: Pacific saury, squid, Pacific jack mackerel, and larval lantern fish.

All of the albacore in suitable condition when hauled aboard were tagged. Experiments designed to test the recovery rate of "spaghetti" tags with that of dart tags were continued. The two types used alternately resulted in a release of 38 "spaghetti" and 36 dart tags. The greatest number of fish tagged at one position was six.

Sea surface temperatures varied from 10.7° to 18.5° C. (51.3° to 65.3° F.). The coolest water extended from the vicinity of Santa Cruz Island to about 200 miles W. by N. of San Miguel Island, while warmest temperatures were found in the southwestern area 400 to 500 miles from Point Arguello.

All albacore were caught within a temperature range of 15.3° to 17.9° C. (59.5°-64.2° F.). The majority (83 percent) was taken in 15.9° to 17.1° C. (60.6° - 62.8° F.) water.

A total of 150 bathythermograph casts to a depth of 400 feet were made approximately 20 miles apart throughout the survey. Additional 900-foot casts were made at several night-light stations.

Sea-water samples from 10-meter Nansen bottle casts were collected for salinity analysis at every second bathythermograph station or at approximately 40-mile intervals.

Night-light stations were occupied on nine occasions while the vessel was drifting on a sea anchor. Pacific sauries were the only organism noted under the 1,500-watt light at all stations. The number attracted varied from 2 to about 100. Organisms occurring at fewer stations were Pacific jack mackerel,

lanternfish, squid and several species of salps.

Daytime observations were considered typical for the area. Albatross and storm petrels were present in small numbers most of the time. Their actions did not appear different in areas where albacore were caught. Large concentrations of Velella lata were observed in two localities. Mammals were rarely observed. Of interest was the occurrence of glass Japanese net floats. A few large and numerous small ones were observed.

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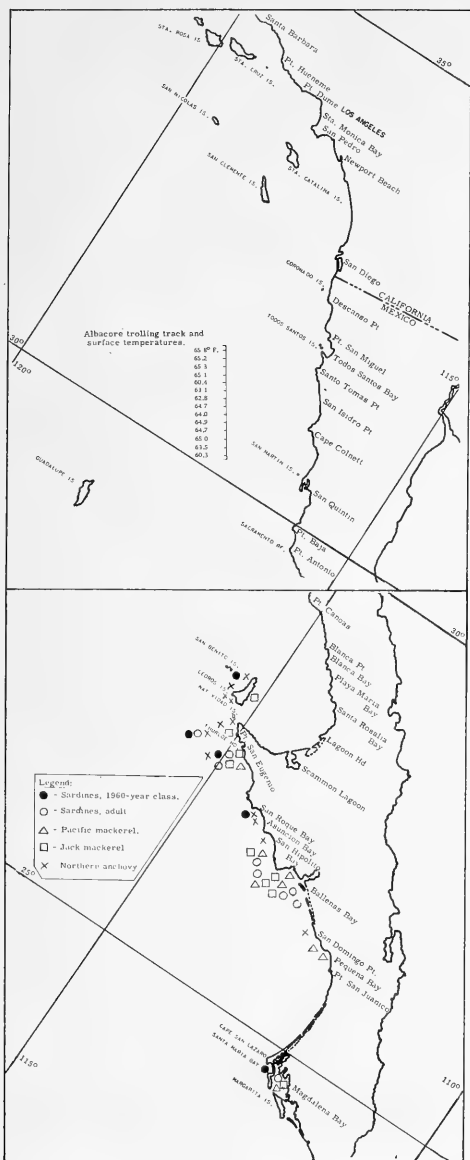
PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 60A6-Pelagic Fish:
The coastal waters off Baja California from Magdalena Bay to Cedros Island were surveyed (July 12-August 1, 1960) by the California Department of Fish and Game research vessel Alaska. The objectives were: (1) to survey the sardine population to determine the amount of recruitment from the 1960 spawning and to measure the density of older fish; (2) to sample sardines for age analysis; (3) to sample Pacific mackerel, jack mackerel, and anchovies for age and distribution studies; (4) to collect live sardines for genetic studies by the U. S. Bureau of Commercial Fisheries Laboratory at La Jolla; and (5) to troll for albacore on the southern extremity of the albacore fishing grounds.

Of the 66 night-light stations occupied, sardines were taken on 12, anchovies on 12, jack mackerel on 9, and Pacific mackerel on 8. In the 411 miles of scouting, 881 anchovy, 3 yellowtail, and 8 unidentified fish schools were sighted.

Sardines of the 1960 year-class were taken on 5 stations. Three samples were taken from fish schools that were predominantly anchovy. Very few young sardines were present at the other 2 stations and none were observed during scouting. Adult sardines were taken on 9 stations mostly in Ballenas Bay. During daylight anchorage in this area more than 100 schools of adult fish were observed.

Anchovies were present in unusually large numbers over the entire area covered. In addition to the schools observed during night



M/V Alaska Cruise 60A6-Pelagic Fish (July 12-Aug. 1, 1960).

scouting, hundreds were seen during daylight hours. They were from 2 to 7 miles offshore in dense to thinly-scattered schools. Fish from some of the dense schools could be brailed during daytime anchorage. The number of samples taken on night-light stations was not representative because the majority of the schools was negatively phototropic. The dominant size group was between 80 and 105 mm.

Larger fish were present only around Cedros Island.

Several thousand adult sardines from Magdalena Bay were delivered alive to the U. S. Bureau of Commercial Fisheries, La Jolla.

A special trolling track was made through previously productive albacore fishing grounds off northern Baja California. No fish were caught or seen.

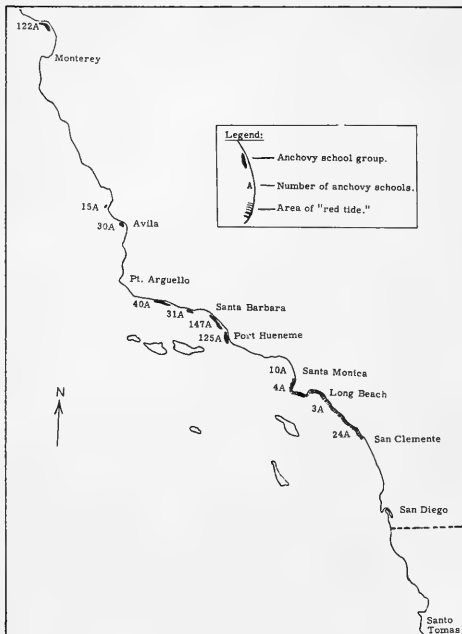
Sea surface temperatures ranged from 78.6° F. at Point San Juanico to 56.1° F. at Thurloe Head. Temperatures along the albacore trolling track ranged from 65.8° to 60.4° F. with an average of about 64.0° F.

Airplane Spotting Flight 60-16 - Pelagic Fish: The inshore area from Punta Santo Tomas, Baja California, to Santa Cruz, Calif., was surveyed from the air (July 22, 25, and 26, 1960) by the Department's Cessna "180" 3632C, to determine the distribution and abundance of pelagic fish schools.

Fog obscured most of the central California coast. Aerial observations were possible only in four small areas--the northern one-third of Monterey Bay, a narrow inshore band from Carmel to Point Sur, a small section of coast near Point Buchon, and San Luis Obispo Bay in the immediate vicinity of the Avila piers. Conditions from Santo Tomas to Point Conception were only fair.

Anchovy schools were most numerous from Port Hueneme to Gaviota where 343 were counted during two days of flying. The observable section of Monterey Bay contained 122 thin schools, all close to shore. Only 41 were seen south of Point Dume and none below San Clemente. Schools containing species other than the northern anchovy were not seen.

Moderate to severe red-water conditions prevailed from Point Dume to San Clemente,



Airplane Spotting Flight 60-16 (July 22, 25, and 26, 1960).

with the heaviest blooms in the Los Angeles-Long Beach Harbor area and from Newport Beach to Dana Point.

Note: Also see Commercial Fisheries Review, Sept. 1960 p. 15.

~~cafish~~

Cans--Shipments for Fishery Products, January- July 1960

Total shipments of metal cans during January-July 1960 amounted to 74,727 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 66,673 tons in the same period a year ago. The increase of about 12.1 percent in the total shipments of metal cans January-July this year as compared with the same period of 1959 was prob-



ably due to the sharp increase in the Alaska canned salmon pack.

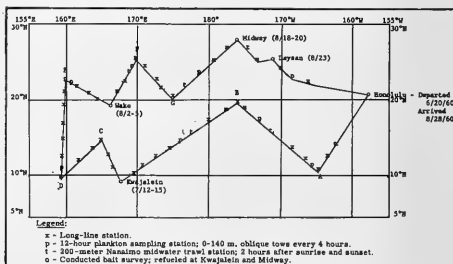
Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.



Central Pacific Fishery Investigations

BIOLOGISTS SEEK ALBACORE TUNA SPAWNING GROUNDS WEST OF HAWAII:

M/V "Charles H. Gilbert" Cruise 48: During a 70-day cruise that began on June 20, 1960, the U. S. Bureau of Commercial Fisheries research vessel Charles H. Gilbert surveyed a wide area (see chart) west of the Hawaiian Islands for albacore tuna spawning grounds. A cooperating Japanese agency (the Nankai Regional Fisheries Research Laboratory at Kochi) conducted a similar survey with the research vessel *Shunyo Maru* in the western Pacific in coordination with the work of the Charles H. Gilbert.



M/V Charles H. Gilbert Cruise 48 (June 20-August 28, 1960).

The survey area was fished with long-line fishing gear in an attempt to capture sexually-mature albacore. In addition to long-lining, the vessel conducted night-light fishing stations and midwater trawling to capture young tunas.

The survey area yielded poor catches of adult albacore. But the survey area was not expected to yield commercial quantities of albacore, the scientists being primarily interested in obtaining data on the sexual maturity and fecundity of the albacore from the area.

While there were but a few large albacore taken, the net collections yielded considerable numbers of larval tuna. Although the collections have not yet been studied, some of these may be larval albacore. If so, this will provide evidence regarding the spawning area and season of this species.

At each of 38 fishing stations, 60 baskets of 210-fathom long-line gear were fished. Baskets consisted of a 20-fathom floatline and 11 3-fathom droppers. Sauries (*Cololabis saira*) were used for bait. The best fishing occurred between 10° and 20° N. latitude in the

area between the Hawaiian Islands and Kwajalein--big-eyed and skipjack tuna predominated. Albacore catches were poor and scattered throughout the survey area. Of the six albacore taken, only one was a female. The ovaries appeared to be in the late developing stage.

Fifteen "Nanaimo" midwater trawl hauls were made before failure of the trawl winch. Generally, trawl hauls during the daylight hours yielded poor catches. The catch in the night hauls, although not spectacular, yielded more organisms, mainly shrimp and lanternfish.

Four to 500 buckets of Marshallese sardine (*Harengula kunzei*) were seen at Kwajalein. Also seen were some iao (*Atherinidae*), but no estimate of abundance was obtained since these were seen at night.

At Wake Island, very large concentrations of oama (*Mullidae*) were observed all along the shores of the lagoon. Also, an estimated 100 buckets of 4- to 5-inch aholehole (*Kuhliidae*) were seen in the lagoon.

At Midway, about 120 buckets of iao (*Pranesus insularum*) were seen along the northeast and eastern shores of Sand Island. Isolated smaller schools of piha (*Spratelloides delicatulus*) and about 400-500 buckets of aholehole were also counted.

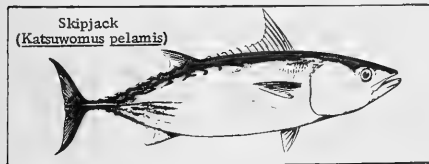
Bait survey at Laysan Island showed that there were about 100-200 buckets of small aholehole (2-3 inches) and about 400-500 buckets of large aholehole (5-10 inches) all along the shore.

Long-line fishing was poor. The total catch was 6 albacore, 6 yellowfin, 28 big-eyed, 15 skipjack, 44 spearfish, 87 sharks, and 34 miscellaneous fishes.

Two yellowfin, 2 skipjack, and 12 unidentified tuna schools were sighted during the cruise. Direct and incidental trolling produced 4 dolphin and 2 wahoo.

REACTION OF SKIPJACK TUNA TO NETS TESTED:

The skipjack tuna found off Oahu's Waianae coast in September 1960 were confronted for the first time with a 300-foot deep wall of nylon net, set in their path by the crew of the U. S. Bureau of Commercial Fisheries' research vessel Charles H. Gilbert. Most of the skipjack managed to avoid the strange barrier--only 10 fish were entangled and landed in the huge gill net. The biologists of the Bureau's Honolulu Biological Laboratory, who planned and directed the experiment, were not particularly discouraged by this small catch, for the trial was conceived as only a first step in linking the Laboratory's studies of tuna behavior with tests of the latest in tuna-fishing methods.



The idea was to see how Hawaiian tuna schools, which are notoriously fast and shifty, would react to a net under the conditions of water clarity and water

temperature which obtain in Hawaiian waters. The Charles H. Gilbert is uniquely equipped for such studies as it is the only tuna-fishing vessel in the world with observation windows in the hull below the waterline. The biologists were not content, however, with confining their observations to those windows, but put on their diving masks and went into the sea with the net to spy on the tuna in their own element.

The experiment has significance in a larger picture of increasingly worldwide competition among tuna fishermen to supply the United States market. This competition stimulates a constant search for more efficient methods of harvesting tuna that has in the past few years brought almost revolutionary changes to the Southern California tuna fishing industry. New tools, such as larger and stronger nets made of nylon and power equipment for hauling the nets, and the new techniques that these tools have brought forth, are enabling the California fishermen to produce tuna more efficiently and more cheaply than has ever been possible when live-bait and pole fishing were employed. Thus their competitive position has been increased over that of Hawaiian fishermen, who still rely on pole-and-line fishing methods.

It is generally thought that the success of net fishing methods for tuna off the West Coast is due to the fact that the deep seines reach down through the thin layer of warm surface water in which the tuna live. The fast-swimming fish, which otherwise would find it easy to escape under the curtain of netting, are stopped by the cold water that they run into as soon as they dive.

Around Hawaii the warm surface water extends down much deeper than it does off the West Coast. The Laboratory's first problem was, therefore, to find out whether a net could be set deep enough in Hawaiian waters to reach water temperatures that would turn back an escaping tuna school. The results of the experiment, which consisted of only four sets on small, fast-moving schools with a make-shift net, are not expected to be conclusive, but the Laboratory's scientists plan to make further trials along similar lines in search of knowledge that will enable Hawaii's tuna fishermen to bring their productive efficiency up to the most advanced level.

TAGGING RETURNS INDICATE THAT THE SKIPJACK TUNA IS NOT A WIDE-RANGING SPECIES:

Over 13,000 skipjack tuna have been tagged in Hawaiian waters with the D-2 dart tag, since the initiation of the tuna research program by the Honolulu Laboratory of the U. S. Bureau of Commercial Fisheries. Although the recoveries--nearly 1,300--have indicated considerable movement among the islands, there are no records of recapture of the tagged fish in any other fishery. The Hawaiian skipjack fishery is seasonal; the bulk of the annual catch is made between May and September. Although it is hypothesized that these fish enter the Hawaiian area in the spring and leave in the fall, there has been a lack of returns from other areas of skipjack tagged in the Hawaiian waters, a lack of positive evidence that fish recovered one or more seasons after tagging have actually been away during the interim, and a lack of recoveries in Hawaiian waters of skipjack tagged elsewhere in the Pacific. As a result, biologists have increased their efforts to find out where they come from and where they go.

In April 1960, 46 skipjack were caught, tagged, and released from the Bureau's research vessel, Charles

H. Gilbert, near Roca Partida of the Revillagigedo Islands group, which lie off the west coast of Mexico. Although the results of this limited tagging effort has failed to provide any answers, it is interesting to note that 11 of the tagged tuna were recaptured within two months after release and all but one from within the area of release. One fish was recovered about 180 miles north of the release area.

The comparatively high percentage of recovery of tagged skipjack may reflect the existence of a resident population associated with a group of islands, or their movement may have been temporarily restricted by certain environmental factors. In May 1958, 2,000 skipjack were tagged and released in an area off Hilo, Hawaii. A total of 431 of the tagged fish, or 21.5 percent were recaptured within 3 months, with all but 2 from the same general area of release. These fish may have been "trapped" in a patch of low salinity water surrounded by water of higher salinity and, presumably, also differing in other characteristics. Later returns showed that at least some of the skipjack tagged off Hilo regrouped with other schools and moved north-westerly along the Hawaiian archipelago.

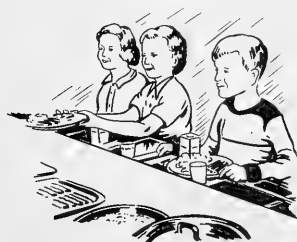
Tag returns from individual schools suggest that, normally, the skipjack in Hawaiian waters remain within a school for one month or less, then at least some of the school break off, move into new areas, and regroup with other fish or schools. From the releases off Hilo and Mexico, however, it is evident that there are situations, possibly environmentally conditioned, where the schools remain intact and within a restricted area for at least 2 or 3 months and thus are readily available to capture by fishermen.



Chicago

CONSUMPTION OF FROZEN FISH AND SHELLFISH IN RESTAURANTS AND INSTITUTIONS:

Chicago was one of ten selected cities in which a survey was undertaken to obtain information on the consumption of frozen processed fish and shellfish in institutions and public eating places. A total of 842 establishments were surveyed in that city. About four-fifths of all the establishments in Chicago bought some kind of frozen fishery products in the 12 months preceding November 1958, the month the survey was made. Of this



group, about 74 percent said they had bought frozen processed fishery products during the period.

Further breakdown of frozen fishery products purchases in November 1958 shows that 46 percent of the establishments surveyed bought frozen processed fish, 35 percent bought frozen processed shellfish, and 13 percent bought frozen portions. The incidence of use of frozen processed fishery products, by institutions (such as schools and hospitals) was greater than restaurants. Of the ten cities in the survey, Chicago ranked fourth in terms of the percentage of all establishments buying frozen processed fishery products during the month of the survey. Chicago establishments most typically bought frozen processed fish in 5-pound packages, and frying was the most popular method of cooking.

Among the establishments using frozen processed shellfish, two-thirds bought breaded shrimp in November 1958, and one-fourth bought raw shrimp. Large quantities of both items were purchased. But breaded shrimp and raw shrimp also were bought widely, and in large quantities, in all the other cities included in the survey.

As with frozen processed fish, the leading shellfish items were also most often bought in 5-pound packages in Chicago. Frying was the most popular method of cooking shellfish.



Only about one-eighth of the establishments surveyed in Chicago bought portions during the month of the survey. This included 73 restaurants and 35 institutions. About 14,000 pounds of portions were purchased by these establishments in November 1958.

Chicago ranked ninth among the ten cities in percentage of establishments buying frozen portions. In Chicago, portions were most often bought uncooked-plain and uncooked-breaded. Nearly all establishments indicated that they were satisfied with the quality and condition of the portions.

About 10 percent of the users of portions in Chicago indicated that the quality was better than that of other frozen processed fish.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES:

JANUARY-JULY 1960: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.9 million pounds (value \$1.1 million) of fresh

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, July 1960 with Comparisons

QUANTITY				VALUE			
July		Jan.-July		July		Jan.-July	
1960	1959	1960	1959	1960	1959	1960	1959
..... (1,000 Lbs.) .....				..... (\$1,000)			
1,909	2,272	13,649	13,618	1,084	1,203	7,070	7,190

and frozen fishery products were purchased in July 1960 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in June by 29.8 percent and 16.0 percent under the amount purchased in July 1959. The value of the purchases in July 1960 was lower by 8.3 percent as compared with June and 9.9 percent less than for July 1959.

During the first seven months of 1960 purchases totaled 13.6 million pounds (valued at \$7.1 million)--a decrease of 0.2 percent in quantity and 1.7 percent in value as compared with the similar period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in July 1960 averaged 56.8 cents a pound, about 12.8 cents more than the 44.0 cents paid in June and 3.4 cents more than the 52.9 cents paid during July 1959.

Canned Fishery Products: Tuna was the only canned fishery product purchased for

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, July 1960 with Comparisons

Product	QUANTITY				VALUE			
	July		Jan.-July		July		Jan.-July	
	1960	1959	1960	1959	1960	1959	1960	1959
..... (1,000 Lbs.)								
..... (\$1,000)								
Tuna ..	481	151	1,930	1,982	204	70	860	938
Salmon	-	1	3	13	-	1	2	10
Sardine	-	107	84	776	-	16	35	116

the use of the Armed Forces during July this year. In the first seven months of 1960 purchases of canned fish were lower by 27.2 percent as compared with the same period in 1959.

JANUARY-AUGUST 1960: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 2.4 million pounds (value \$1.2 million) of fresh and frozen fishery products were purchased in August 1960 by the Military Subsistence

Supply Agency. This exceeded the quantity purchased in July by 24.5 percent and was 12.5 percent higher than the

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, August 1960 with Comparisons

QUANTITY				VALUE			
Aug.		Jan.-Aug.		Aug.		Jan.-Aug.	
1960	1959	1960	1959	1960	1959	1960	1959
..... (1,000 Lbs.) .....				..... (\$1,000)			
2,337	2,112	16,036	15,730	1,190	859	8,260	8,049

amount purchased in August 1959. The value of the purchases in August 1960 was higher by 9.8 percent as compared with July and 38.5 percent above August 1959.

During the first eight months of 1960 purchases totaled 16.0 million pounds (valued at \$8.3 million)--an increase of 1.9 percent in quantity and 2.6 percent in value as compared with the similar period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in August 1960 averaged 50.1 cents a pound, about 1.7 cents less than the 51.8 cents paid in July but 9.4 cents higher than the 40.7 cents paid during August 1959.

Canned Fishery Products: Tuna was the principal canned fishery product purchased for the use of the Armed Forces during August this year. In the first eight months of 1960 purchases of canned tuna were up 5.7 percent but purchases of both canned salmon and sardines were sharply lower as compared with the same period of 1959.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, August 1960 with Comparisons

Product	QUANTITY				VALUE			
	Aug.		Jan.-Aug.		Aug.		Jan.-Aug.	
	1960	1959	1960	1959	1960	1959	1960	1959
..... (1,000 Lbs.)								
..... (\$1,000)								
Tuna	324	150	2,254	2,132	133	59	993	997
Salmon	1	2	4	15	1	2	3	11
Sardine	15	194	99	970	6	27	41	143

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Films

SALMON FILM WINS HONORS AT EDINBURGH INTERNATIONAL FILM FESTIVAL:

Salmon - Catch to Can, a 14-minute, sound color film sponsored by the Canned Salmon Institute and produced and distributed by the

U. S. Bureau of Commercial Fisheries was accorded honors at the Edinburgh, Scotland, 14th Annual International Film Festival, the Department of the Interior announced on September 29, 1960.

This is the third Bureau of Commercial Fisheries' film to receive honors at Edinburgh Festivals in recent years. An appropriate certificate will be presented during the winter to the Secretary of the Interior. Such presentation is usually made by the British Ambassador.

The award consists of being selected for showing at the Edinburgh Festival where films from about 30 nations compete for a place on the coveted program.

Salmon - Catch to Can was filmed primarily in Alaska. Among other scenes portrayed are the fish ladders at Bonneville Dam on the picturesque Columbia River. The picture shows the life history of the salmon; the three most prominent methods of harvest--purse-seining, gill-netting, and trolling; fishery management programs to assure a continuing resource; a glimpse of the canning process; and a "lead-in" to a second 14-minute film entitled Take a Can of Salmon.

The second film is a cookery presentation and may be used with the first one or separately. Both films are supplemented by a full-color recipe booklet also entitled Take a Can of Salmon¹. Motion picture facilities of MPO Productions, New York City, a commercial motion picture producer, were used in making the honor-winning film.

¹/For sale at 15 cents a copy by the U. S. Government Printing Office, Washington 25, D. C.



Fish Kills

NATIONWIDE STATISTICAL REPORTING SYSTEM SET UP:

The U. S. Public Health Service early this year started a nationwide system for reporting the frequency and locations of fish killed by pollution. The project, a cooperative effort between the Public Health Service, the U. S. Fish and Wildlife Service, and State conservation agencies, is the first national tabulation of pollution fish kills that has been undertaken.

In announcing the project, the Surgeon General said it will be an effective means of obtaining additional basic information needed to determine the effects of pollution on the Nation's water resources, as required by the Federal Water Pollution Control Act. All State fish and game conservation agencies are being asked to provide continuing reports of fish killed by pollution as they occur in the Nation's rivers, lakes, and coastal waters. Reports will be made directly to the Public Health Service in Washington, D. C.

The Public Health Service will furnish the U. S. Fish and Wildlife Service with a copy of each report received, as it is received. The two agencies will cooperate in planning fish-kill statistics so they can be used in fish and game management as well as water pollution control.

Quarterly and annual reports of fish kills, listing numbers, locations and causes, when known, will be published. These reports will be distributed to the cooperating agencies, organizations, and individuals who request them.



Fish Meal

FREIGHT RATES FOR MEAL AND SCRAP REDUCED:

Effective October 4, 1960, freight rates were reduced on fish meal and fish scrap originating from South Atlantic and Gulf points ranging from Beaufort (N. C.)-West Port Arthur (Tex.) to destinations in Illinois, Kentucky, and Missouri. The new rates for domestic meal are 6 cents per hundred pounds over the previously-published rates for imports shipped from Southern ports, such as New Orleans, La., Jacksonville, Fla. Because imports are subject to port charges, the net effect is equalization of the inland transportation cost for both domestic and imported meal traffic. For intermediate destination points, the rates will be no higher than the rate for the next more distant point as published in the tariffs.

In November 1959 rates on imported fish meal were reduced from Gulf ports to Midwestern points. As a result, the cost for shipping imported fish meal was about \$5 to \$19 a ton less than for shipping domestic fish

meal. This freight rate advantage for imported fish meal with an increased foreign supply worked to the disadvantage of domestic fish meal manufacturers.

During the past several months members of the Industrial Products Traffic Committee of the National Fisheries Institute, with the assistance of a representative of the U. S.



Bureau of Commercial Fisheries, met with representatives of western, southern, and eastern railroads to explain the depressed conditions of the fish meal industry. After several public

hearings as well as informal meetings, the carrier rate-making groups approved the new reduced freight rates.



Florida

FISHERIES RESEARCH:

The Marine Laboratory of the University of Miami is conducting research on fisheries. Research of interest to commercial fisheries contained in the Laboratory's June 1960 Salt Water Fisheries Newsletter follows:

Shrimp Larvae: The larval life history of the pink shrimp has been studied at The Marine Laboratory with the support of the U. S. Fish and Wildlife Service. During the first quarter of 1960 a report was completed which described the shrimp larval stages.

The completion of this fundamental work leads to the next phase, involving the distribution of each stage of the larvae (11 in number) geographically and seasonally. This will give information on how the



larvae get from the offshore spawning grounds to the estuarine nursery areas at the south end of the Florida peninsula. This question needs study since work on the current system in Florida Bay indicates that no onshore currents exist to carry non-swimming larvae inshore.

Spotted Sea Trout Tagging: Research on spotted sea trout and the ecology of the Ever-

glades National Park, the same estuary which serves as nursery ground for the Tortugas shrimp, is being supported by the Florida State Board of Conservation. The study has chiefly involved research on migration and growth of the sea trout populations from Ft. Myers to Apalachicola. By March 31, 5,348 tagged trout had been released. Two types of tags were used, internal tags of green plastic and the same tag to which a small piece of yellow plastic tubing is attached, the latter protruding through the hole in the fish's belly and drawing attention to the presence of the tag within. A total of 445 tagged fish had been reported by the end of March 1960, this being 8.3 percent of the total released. As before, few sea trout had moved very far because some 96 percent were caught within 30 miles of the place of tagging.

Frozen Shrimp Keeping Qualities: Tests have been made of the usefulness of dried extracts of okra (the green vegetable) in improving color, texture, and keeping qualities of frozen shrimp. Tests are also being made of the effects of freezing, thawing, and re-freezing of shrimp on the bacterial count.

Notes See Commercial Fisheries Review, March 1959 p. 34.



Foreign Fishery Developments

COMMERCIAL FISHERIES BUREAU EMPLOYEE REVIEWS FISHERY MATTERS IN WESTERN EUROPE:

A review of fishery reporting by United States embassies and consulates was made by Dr. Sidney Shapiro, Chief, Branch of Foreign Fisheries and Trade, U. S. Bureau of Commercial Fisheries. He left for Europe on September 15, 1960. He planned to talk to government and industry officials about "Common Market" and "Outer Seven" fishery trade problems and brief the Interior representative on the United States Delegation to the GATT trade agreement negotiations in Geneva, Switzerland.

The U. S. Bureau of Commercial Fisheries has been working with the Department of State to improve reporting on foreign fishery developments. The Bureau is now undertaking a complete revision of the fishery reporting requirements in an effort to expand and develop useful and urgently-needed information on foreign developments as they affect the United States fishing industry. Timely and accurate reporting of information useful to United States firms was among the rec-

ommendations made by representatives of the fishing industry at a special conference on fishery export trade, held in Washington on June 20, 1960.

Another objective of the trip was to determine the proposed trade policies expected to affect the United States fisheries in connection with the establishment of the European Common Market. As yet, no information is available on the procedures that may be adopted for unifying markets, prices, and support policies for fishery products. As well as affecting United States trade directly, Common Market policies on tariffs may affect imports into the United States from countries outside the Common Market.



Fur Seals

TWO RUSSIAN SCIENTISTS STUDY HERDS AND FACILITIES ON PRIBILOF ISLANDS:

Two Russian fishery scientists and an interpreter arrived in September 1960 on St. Paul Island in the Pribilofs for a two-week study of the fur seal rookeries and the United States harvesting installations and management practices on the islands.

Two United States fishery scientists, both of the U. S. Bureau of Commercial Fisheries, at the same time went to Russia's Robben Island off the coast of Siberia for a similar study of the Russian fur-seal resource.

The exchange of scientific information and personnel is provided for in the fur seal convention signed in 1957 by the Soviet Union,

Canada, Japan, and the United States. The convention provides for a six-year study of the northern fur seals as a means of obtaining information necessary for improved management of both the American and Asian herds



Although both Russian and American sealing operations had been completed for the

year, during the scientists' visit the seal herds were starting their exodus for the high seas where they will intermingle to some extent during the winter months. In the spring the seals will return to their respective rookeries to breed and bear their young.

The United States scientists are Dr. Victor B. Scheffer, biologist from the Bureau's laboratory in Seattle and Eugene M. Maltzell, biologist-interpreter from Portland, Ore. The Russian scientists are from the Soviet installations on Kamchatka. They are Timofei Mikhailovich Kantatnov, an engineer, and Petr Georgievich Nikulin, manager of the Kamchatka Laboratory on Oceanography. The translator is Leonid Vasilevich Kostin. Fukuzo Nagasaki, Tokyo biologist, and Sergei V. Dorofeev, Moscow biologist, have joined the Americans on Robben Island.



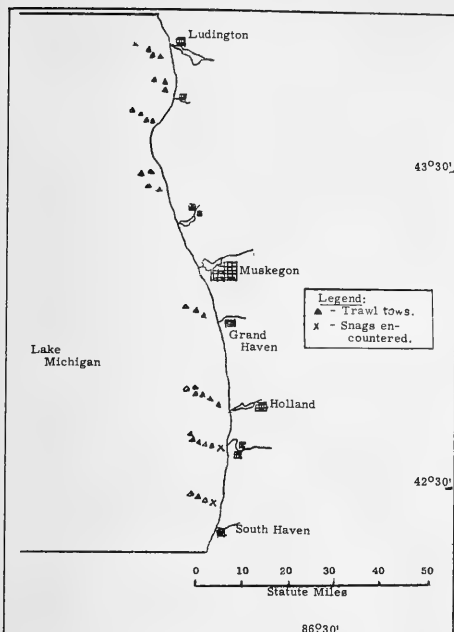
Great Lakes Fisheries Exploration and Gear Research

COMMERCIAL POTENTIAL OF UNDERUTILIZED FISH STOCKS IN LAKE MICHIGAN SURVEYED:

M/V "Art Swaer II" Exploratory Cruise 1: The first in the 1960 series of Lake Michigan exploratory cruises was completed August 17 when the U. S. Bureau of Commercial Fisheries chartered vessel Art Swaer II returned to Ludington, Mich. The primary objectives of the survey were to assess the commercial potential of underutilized fish stocks in the waters of Lake Michigan from Ludington to South Haven, Mich., and to determine the trawling characteristics of the lake bottom in that area.

During the seven-day cruise, 34 otter-trawl drags were completed in various depths between 10 and 38 fathoms using a standard, 50-foot Gulf of Mexico balloon-type fish trawl. Fishing efforts revealed considerable amounts of chubs (Coregonus sp.) to be available in the 15 - to 30-fathom depth range. The ten most productive drags were made between Ludington and Grand Haven. These ten catches consisted of from 233 to 577 pounds of chubs and averaged 360 pounds per 30-minute drag. These catches contained higher percentages of larger chubs which appeared to be in better physical condition than were fish taken in the more southerly areas.

Bottom conditions were found to be generally favorable for trawling at all but the shallowest depths examined. Depth recordings made at 10 fathoms consistently showed rough bottom conditions, and two of three attempts to drag at this depth resulted in severe damage to the net.

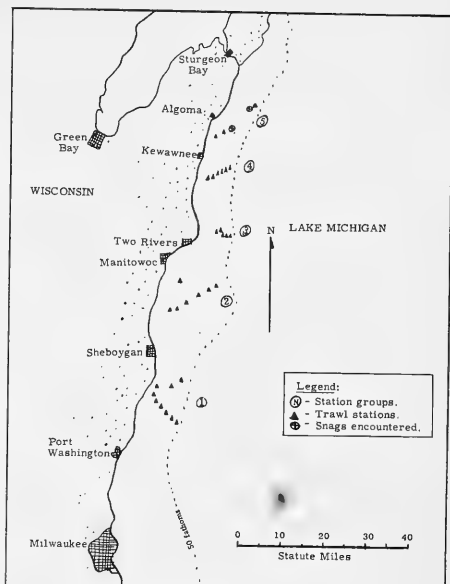


M/V Art Swaer Cruise 1 (August 10-17, 1960).

M/V "Kevinbren" Exploratory Cruise 2: The second Lake Michigan exploratory cruise was completed September 13, when the Bureau chartered vessel Kevinbren returned to Milwaukee, Wis. The Kevinbren is a Great Lakes gill-net tug that has been adapted to the trawl-method of fishing. The objectives of the 7-day cruise were to determine the commercial abundance and seasonal distribution of the various species of fish in the area between Sheboygan and Sturgeon Bay, Wis., and to learn the location of areas suitable for trawling.

Some 32 drags were completed in depths of 14 to 41 fathoms using a 50-foot (headrope), two-seam, Gulf of Mexico balloon-type trawl. Catches ranged from 55 to 705 pounds of mixed chubs, smelt, and alewives per half-hour drag. Best fishing results were obtained in 30-minute drags near Two Rivers in 20 to 36 fathoms, where 4 drags produced from 245 to 705 pounds; near Algoma in 25 to 32 fathoms, where 2 drags caught 304 and 428 pounds; and near Sheboygan in 30 to 32 fathoms, where 1 drag took 465 pounds. Alewives were present in about half of the catches, with the two largest amounts being 100 pounds in a 60-minute drag at 26-27 fathoms near Sheboygan and 30 pounds in a 30-minute drag at 20-21 fathoms near Keweenaw. Smelt were found throughout the operational area, but in amounts of not more than 25 pounds per 30-minute drag.

Extensive echo-sounding operations revealed that the bottom topography varies greatly throughout the area covered. In the southern portion, the slope is

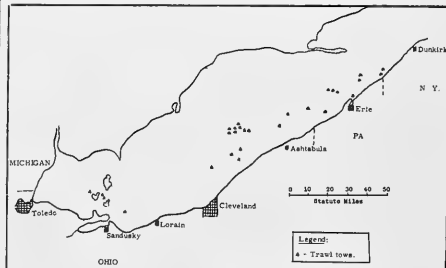


M/V Kevinbren Cruise 2.

rather gentle with only a few areas in the 15-25 fathom range too irregular for fishing operations. North of Two Rivers, the slope becomes steep, irregular, and terraced. Two drags in the northernmost station group resulted in minor gear damage.

SEASONAL DISTRIBUTION STUDIES OF COMMERCIAL FISH STOCKS IN LAKE ERIE CONTINUED:

M/V "Active" Cruise 11: A 17-day trawling survey of the United States waters of Lake Erie, was completed on August 19, 1960, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Active. The cruise



M/V Active Cruise 11 (August 3-19, 1960).

was designed to ascertain the seasonal abundance, distribution, and availability to other trawls of smelt and other species of fish from the Ohio-Pennsylvania boundary to Port Clinton, Ohio.

Although extensive recorded depth-soundings and 28 30-minute drags with a standard, 50-foot, Gulf of Mexico balloon-type fish trawl revealed no large concentrations of smelt, consistent catches (averaging about 200 pounds of smelt) were taken in the central basin area at depths of about 10-13 fathoms. Largest catch of the cruise was 400 pounds of smelt taken in 12-13 fathoms northeast of Cleveland. Small amounts of yellow perch, burbot, and sheepshead were taken--mostly in shallower water. No gear damage was experienced.

M/V "Active" Cruise 12: The Active left Erie, August 29, for three weeks of trawl explorations in Lake Erie.

The main purpose of cruise 12 was to cover as much of Lake Erie as possible with continuous depth-sounding and fishing effort in order to locate and determine the availability to trawls of such fish stocks as smelt, yellow perch, sheepshead, and gizzard shad.

The Active was scheduled to take part in a two-day synoptic survey of Lake Erie in cooperation with 12 other vessels representing the Bureau and five other fisheries agencies. The synoptic survey was concerned with the ecological characteristics (especially the horizontal and vertical oxygen content) affecting the fish of Lake Erie.

Note: Also see Commercial Fisheries Review, Sept. 1960 p. 20.



Great Lakes Fishery Investigations

LAKE ERIE FISH POPULATION SURVEY:

M/V "George L." August 1960: Intensive trawling operations (108, 10-minute tows) by the U. S. Bureau of Commercial Fisheries research vessel George L. in the East Harbor and Bono areas in early August revealed more clearly that young-of-the-year fish generally were scarcer than in 1959. Most notable were the reduced catches of yellow perch and yellow pike. Only 5 young-of-the-year yellow pike were captured.

Yellow pike, hatched in 1959, now average 13 inches long (the legal length in Ohio) and range from about 10 to 15 inches long. The average yearling yellow pike landed by the commercial fishery is 13.4 inches and the average weight is about $\frac{3}{4}$ pound. About 95 percent of the yellow pike now landed in Ohio are yearling fish. At the present rate of growth, about 90 percent of the yearlings should be over 13 inches long by the end of the year.

High mortality of fish taken by trap nets in the Huron-Vermilion area has forced some fishermen in those areas to remove their nets. Low oxygen concentrations at night in bottom waters apparently have been responsible for the mortality. Low oxygen concentrations near the bottom in parts of the central basin were common in the summers of both 1959 and 1960.

An interagency synoptic survey of conditions in Lake Erie was conducted on August 30-31. The Bureau's research vessels Active and George L., Ohio Divisions

of Wildlife and Shore Erosion vessels SP-1, SP-3, SE-1, Ontario Department of Lands and Forests vessel Keenosay, Pennsylvania Game and Fish Commission vessel Perca, University of Toronto vessel Dauphine, and Ohio State University participated in the lake-wide survey. Data were collected on turbidity, water temperatures, oxygen concentrations, pH, alkalinity, water quality, and plankton. Analyses of these data should better describe the nature of the environmental conditions that influence fish production in Lake Erie.

Note: Also see Commercial Fisheries Review, Oct. 1960 p. 30.

LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 6: The fish population survey in southern Lake Michigan was continued (August 9-23, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Cisco. Tows with a commercial-type, 52-foot balloon trawl continued to yield rather small catches.

The tows off Grand Haven were approximately straight west of port, except for the 4-, 7-, and 10-fathom drags which were 4-6 miles south. The tows off Racine were northeast of port, and off Milwaukee, the 15-, 20-, and 25-fathom drags were about 12 miles north. The remainder were northeast of port. Bloaters (Leucichthys hoyi) made up 98-100 percent of the chub catches. Fish caught with the chubs were usually limited to small numbers of smelt and slimy sculpins in shallow water, and deep-water sculpins in deeper tows. In the following instances, however, the catch composition varied markedly from the usual: 4 fathoms off Grand Haven--16 pounds of alewives, and small numbers of spottail shiners and emerald shiners; 7 fathoms off Grand Haven--69 pounds of alewives, 30 pounds of spot-tail shiners, and 20 pounds of carp (2 individuals); 10 fathoms off Grand Haven (average of 3 tows)--54 pounds of alewives, 19 pounds of yellow perch, and 21 pounds of whitefish (9 of 39 whitefish in the 3 tows were of legal size); 50 fathoms off Grand Haven--130 pounds of deep-water sculpins.

Gangs of nylon gill nets (50 feet each of 1 $\frac{1}{4}$ - and 1 $\frac{1}{2}$ -inch, 200 feet of 2-inch, and 300 feet each of 2 $\frac{3}{8}$ -, 2 $\frac{1}{2}$ -, 2 $\frac{3}{4}$ -, 3-, 3 $\frac{1}{2}$ -, and 4-inch mesh) were set overnight at 25 and 50 fathoms off Grand Haven and off Racine. Catches were light.

A gang of nylon gill nets (minus the 100 feet of 2-inch mesh) set for 5 nights at 80 fathoms off Racine took 1,670 chubs. It appeared that the smaller meshes "loaded up" and practically quit fishing early in the set. Nearly all the fish in the smaller meshes were very soft. They must have been in the net for several days. Most of the chubs in this set were difficult to identify, since they were intermediate in appearance between typical L. hoyi and L. kiyi. There were, however, several quite typical L. kiyi, but not nearly so many as were taken in similar sets in the same area in 1954.

Linen gill nets set off Grand Haven, compared with identical gangs set at the same time of year in 1954, took considerably fewer of all chub species at 25 fathoms, and about the same number of bloaters but fewer of other chub species at 50 fathoms. L. kiyi continued to be especially scarce in sets made this cruise. Nothing of significance other than chubs was taken in the gill nets.

Hydrographic collections and observations were made at 25-fathom stations off Grand Haven and Racine and

at a 70-fathom station in midlake between Grand Haven and Racine. Surface water temperatures were very uniform along the transect made across the lake from Grand Haven to Racine, ranging mostly from about 69° F. on the east side to about 67° F. on the west side. Extremes recorded during the cruise were 64.2° F. and 73.4° F.

M/V "Cisco" Cruise 7: Light chub catches were made (August 30-September 12, 1960) in gangs of nylon gill nets (50 feet each of 1½- and 1¾-inch, 200 feet of 2-inch, and 300 feet each of 2½-, 2½-, 2½-, 3-, 3½-, and 4-inch mesh) set overnight at 25 and 50 fathoms off Grand Haven, Mich., and off St. Joseph, Mich.

The catch at 50 fathoms off Grand Haven is an average of 4 overnight sets lifted on successive days. These 4 sets, as well as single 2-, 3-, and 4-night sets were made to study variations in catches on successive nights, and differences in catches in nets set for varying lengths of time. The 1-night sets took 277, 217, 151, and 169 chubs, respectively; the 2-, 3-, and 4-night sets took 438, 615, and 760 chubs, respectively. The percentage increase in catch with increased duration of set was greater than during experiments in previous cruises when catches were larger and heavily fishing meshes "loaded up."

Catches were also light in linen gill nets set for 5 nights at 25 fathoms (255 feet each of 2½-, 2½-, 2½-, and 3-inch mesh) and at 50 fathoms (510 feet of each of the above mesh sizes) off Grand Haven. At 25 fathoms there were 215 *Leucichthys hoyi*, 1 *L. alpenae*, and 4 lake herring; at 50 fathoms, 193 *L. hoyi*, 5 *L. alpenae*, 4 *L. reighardi*, 12 *L. kiyi*, and 2 *L. zenithicus*. In identical sets made in 1954 at the same time of year, catches of all species were considerably larger at 25 fathoms; at 50 fathoms there were appreciably fewer *L. hoyi* in 1954, but about the same numbers of the other species. A few deep-water sculpins were all that were taken with the chubs and herring in the gill nets.

A 52-foot commercial-type balloon trawl was fished off Grand Haven and St. Joseph. All tows off St. Joseph were approximately due west of port as were all tows off Grand Haven except those at 7, 10, and 12 fathoms, which were at 6 to 6 miles south of port. The trawl catches were generally smaller than during previous cruises. The catches at intermediate depths (15° to 40° F.) were exclusively chubs except for a few deep-water sculpins and slimy sculpins and an occasional yellow perch or smelt. At 45 and 50 fathoms off Grand Haven, however, 136 and 202 pounds, respectively of deep-water sculpins were taken; and in the 7-, 10-, and 12-fathom drags off Grand Haven, yellow perch, alewives, and smelt were common (237 pounds of perch at 7 fathoms, 52 pounds of alewives at 10 fathoms, 18 pounds of smelt at 12 fathoms). At 7 fathoms there were also 25 pounds of spot-tail shiners and a few longnose suckers. Usually the chubs in the catches were 95 to 100 percent bloaters, but in the 20-fathom tow off St. Joseph, *L. zenithicus* and *L. alpenae* made up about 20 percent of the take.

Hydrographic collections and observations were made at regular 25-fathom stations off Grand Haven and St. Joseph. Surface-water temperatures, mostly about 75° F., were the highest observed this year. The maximum recorded in the open lake was 77.4° F. Near the end of the cruise, however, strong northerly winds set up a stiff current, and a resultant upwelling dropped surface-water temperatures to as low as 54.6° F. near the shore

off Grand Haven. The area of upwelling extended out from shore about 3 miles.

Note: Also see Commercial Fisheries Review, Oct. 1960 p. 30.

WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

M/V "Sisowet" Cruise 5: Studies during this cruise were conducted (August 8-17, 1960) by the U. S. Bureau of Commercial Fisheries research vessel *Sisowet* at Isle Royale, Mich., Thunder Bay, Ont., and Grand Marais, Minn. The Isle Royale stations were located in Rainbow Cove, north of Thompson's Island, south of Mott Island, northeast of Gull Island, southeast of Canoe Rocks, Todd Harbor, and east of Rock of Ages. In Thunder Bay the stations were located between Pie and Welcome Islands, and just south of Thunder Cape. At Grand Marais the station was just south of Grand Marais Harbor.

The objectives of cruise 5 were to collect various forms of chubs (*Leucichthys* sp.) and lake trout morphological studies, and to compare the relative abundance of the lake trout with previous years' catches.

Gill nets were fished at each station. The gangs were mostly small-mesh nets (1-, 2-, 2½-, 2½-, 3-, 3½-inch mesh). One 6-inch-mesh net was attached to the gang in search of large trout.

Good collections of chubs were made at nearly all stations in the Isle Royale area. A total of 451 *L. hoyi*, 216 *L. zenithicus*, and 116 *L. kiyi* were taken. The catch of small lake trout (409) was greater than the catch of 1959 (362) and 1958 (208). Most of the trout were 12 to 16 inches long. Only two large trout (*Sisowets*) were captured and only one fish was scarred by lamprey.

The state of gonads from the Isle Royale chubs suggested that *L. kiyi* is the first to spawn in the fall; *L. zenithicus* spawns possibly in late fall or early winter; and *L. hoyi* spawns in late winter or early spring. The appearance of *L. zenithicus* at Isle Royale was similar to that of *L. reighardi* in the eastern part of Lake Superior. The *L. reighardi* have been observed, however, to spawn in the spring. Morphological studies must be made of these two species to seek means of separation.

The catches in the Thunder Bay region are believed to have included *L. reighardi dymondi*, a subspecies reported to exist along the north shore of Lake Superior. Positive identification was not made in the field, but preliminary examination of the fish strongly suggested its identity as *L. dymondi*.

The catch at Grand Marais, Minn., consisted mainly of bloaters (*L. hoyi*). The sexual development of these fish agreed very closely with that of bloaters taken at Isle Royale and Thunder Bay.

Fish collected from all areas for morphological studies totaled 204 *L. zenithicus*, 212 *L. hoyi*, 95 *L. kiyi*, 79 lake trout, 57 unidentified chubs, and 21 lake herring.

Surface temperatures at Isle Royale ranged from 55.7° F. northeast of Gull Island to 62.0° F. south of Mott Island. At Thunder Bay the surface temperature was 54.5° F. at Thunder Cape and 61.0° F. between Pie

and Welcome Islands. The surface temperature at Grand Marais, Minn., was 56.4° F.

Note: Also see Commercial Fisheries Review, Oct. 1960 p. 32.



Gulf Exploratory Fishery Program

EXPLORATORY FISHING FOR INDUSTRIAL FISH:

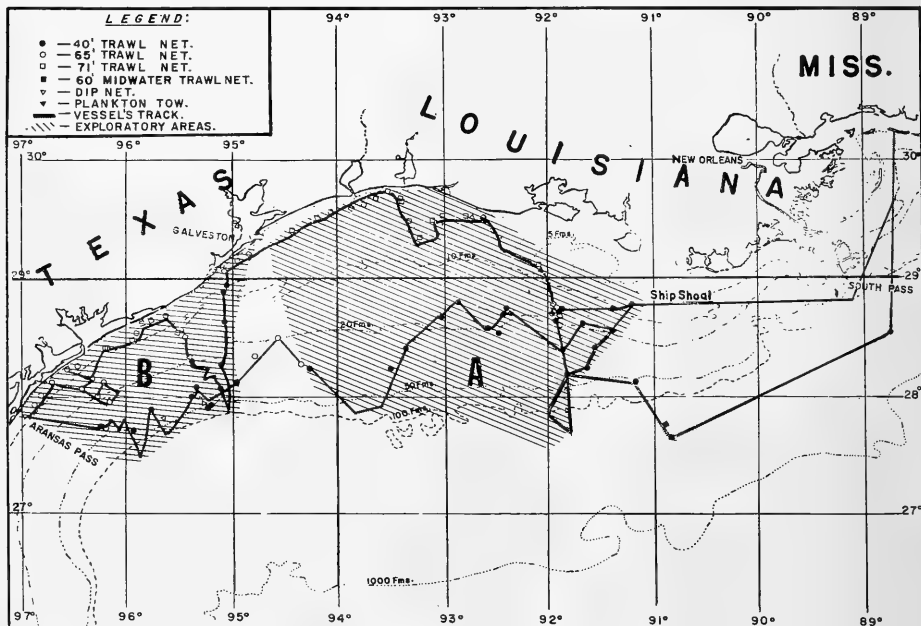
M/V "Oregon" Cruise 69: A 25-day exploratory survey (August 1-25, 1960) of industrial fish concentrations was made by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon between Ship Shoal, La., and Aransas Pass, Tex. A total of 81 bottom trawling stations, 3 midwater trawling stations, 8 dip-net stations, and 1 plankton station was made. A total of 20 surface-salinity readings was taken over the trawling areas.

beyond 30 fathoms were uniformly poor and transects out to 100 fathoms showed untrawlable bottom for the available gear. Midwater schools of fish were not encountered during any phase of the trip.

The best results were obtained between Ship Shoal and Galveston in 3 to 10 fathoms. The largest catch in this area was 4,200 pounds in a 2-hour drag. One drag made in 17 fathoms produced 1,500 pounds of round herring (Etrumeus sp.) and another produced 1,000 pounds of butterfish (Poronotus sp.).

One item of interest was the proportion of menhaden taken by bottom trawls. There were two species; Brevoortia patronus averaging 10-11 inches and B. gunteri averaging 6-7 inches. Surface salinity in the area ranged from 27.7 p.p.t. to 36.0 p.p.t.

Between Galveston and Aransas Pass, Tex., the most productive depths were also 3 to 10 fathoms. The best drags were made off Pass Cavallo where 1,500 pounds



M/V Oregon Cruise 69 (August 1-25, 1960).

Bottom trawls of three sizes were used during the trip. The most productive was a 71-foot, 2-seam balloon trawl using 10 by 3 foot chain-hung doors. A 65-foot, 4-seam flat trawl was used in some of the shallow water drops, and a 40-foot, 2-seam balloon trawl was used where doubt existed about bottom conditions.

Catches between 10 and 30 fathoms were generally light and consisted primarily of scud (Decapterus sp.) and porgy (Stenotomus sp.). Bottom trawling conditions

of fish were taken in 1½-hour drags. Surface salinity in the area ranged from 37.1 p.p.t. to 38.4 p.p.t.

Approximately 600 pounds of various species were frozen or preserved for technological and biological studies.



Gulf Fishery Investigations

Following are some of the highlights of the studies conducted by the Galveston, Tex., Biological Laboratory of the U. S. Bureau of Commercial Fisheries during July-September 1960:

SHRIMP FISHERY INVESTIGATIONS: Pink Shrimp Growth: Investigation of the growth of pink shrimp during early juvenile stages was initiated in early August. Approximately 11,000 specimens taken from an arm of Biscayne Bay were graded to sizes ranging from 9 to 14 mm. (carapace length), marked by "feeding" them trypan red stain, and released. Bait shrimp fishermen and dealers were alerted to recover the marked shrimp, but none have been recaptured to date. A sample of 100 shrimp so marked is being held alive to check the stain's retentivity. Indications are that despite no recoveries, the marking phase of the experiment was a success.

Mortality of Marked Shrimp: The third phase of an experiment designed to evaluate the effects of marking as measured by the comparative survival of shrimp marked by various methods was completed this quarter. As in the two previous phases, stained and unmarked (control) shrimp experienced approximately equivalent survival. Specimens tagged with Petersen discs suffered appreciably greater mortality.

Larvae Studies: Efforts to rear penaeid larvae from eggs spawned by laboratory-held females were continued. To date no gravid white shrimp, *Penaeus setiferus*, with spermatophores attached have been taken alive. We are, therefore, investigating the feasibility of artificial fertilization, mixing eggs taken from gravid females with sperm dissected from intact spermatophores. Attempts to obtain fertile eggs by this means have thus far been unsuccessful.

Seabobs, *Xiphopenes kroyeri*, spawned (or, in some cases, aborted) in our aquaria several times during the quarter. Many of the eggs underwent considerable development before succumbing to predation by unidentified microzoans.

Several experiments aimed at improving techniques for rearing larvae were initiated. These involved varying the ratio of medium volume to organism; varying the rate with which the holding medium is agitated; controlling micro-organism populations with antibiotic and other chemical solutions; and rearing *Palaemonetes* (Caridea) larvae to draw inferences as to food requirements needed for optimum survival and growth of late larval stages in *Penaeidae*.

Commercial shrimp post-larvae are being reared to sizes at which species determination using adult characteristics can be made. This will validate the use of existing keys to identify post-larval *Penaeidae* occurring in the Galveston area.

Routine collection and tabulation of commercial production and effort statistics for Galveston Bay's bait shrimp fishery continued as they have since mid-1959. These statistics will be used in conjunction with comparable data obtained from the adjacent offshore fishery in attempts to relate (quantitatively) progeny occupying inshore "nursery" areas and their progenitors inhabiting offshore areas.

Indicative of the seasonal trend, bait production for the quarter showed a marked increase over that of the

previous quarter. Production for July was slightly lower than that for the same period a year ago while August's production exhibited almost a threefold increase. Greater utilization of shrimp for bait during the current year reflects a slight upward trend in local sport fishing activity and the reproduction of larger-than-normal broods of both brown and white shrimp. Comparable statistics are given in the following table:

Month	1960			Lbs. Per Hrs. Effort	1959			Lbs. Per Hrs. Effort
	Catch (pounds)	Composition (%)			Catch (pounds)	Composition (%)		
June	204,200	99	1	106.6	61,200	Data unavailable	5.5	
July	149,600	63	37	42.9	166,000	40	60	54.4
Aug.	218,600	19	81	95.2	82,000	9	91	38.1
Sept.		Data not yet available			67,700	20	80	31.5

INDUSTRIAL FISHERY STUDIES: Considerable progress has been made in compiling and evaluating data collected during the past year on the spawning of groundfishes, particularly on the dominant species. Length-weight data were compiled and some sample curves worked out.

Croaker, spot, and white trout constituted 62 percent of the total catches by weight in July and 69 percent in August. In July and August 1959 these three species were 69 percent and 64 percent, respectively. Data for September showed the three dominant species constituted about 69 percent of the total catch by weight. Eight additional species made up the bulk of the catch and miscellaneous species constituted 7 percent of the catch by weight for July, 6 percent in August, and 9 percent in September, all of which was slightly less than the same period in 1959. The average number of species for July was 13, 10 for August, and 16 for September. New species identified were as follows: *Euthynnus allisteratus*, *Sphyrna barracuda*, *Monacanthus ciliatus*, *Ophiodon holbrooki*, *Epinephelus niveatus*, *E. filamentosus*, *Lopholatilus chamaeleontion*, *Spheroides spengeri*, and an, as yet, unidentified flat fish. Our check list of species observed in industrial landings in the Pascagoula area now totals 181 vertebrates of 77 families and 32 species of invertebrates of 26 families. An unusual catch was made by the petfood trawler Deacon's Daughter when she took a 12-foot female tiger shark, *Galeocerdo cuvier*, estimated at over 600 pounds, off Horn Island in 4 fathoms of water.

Forty landings were sampled in July from a total of 1,724,943 pounds, 35 in August from 1,048,210 pounds and 30 in September. Fishing was disrupted in the middle of September by hurricane "Ethel." The average depth fished in July was 5 fathoms, in August it was 4.8 fathoms, and September 5 fathoms. Many of the large refrigerated vessels continued fishing west of the Mississippi River Delta well into August. During the same period of 1959, no vessels from the Pascagoula fleet were fishing in the area west of the river. By early September the entire fleet was fishing generally from just east of the Mobile ship channel to the Horn Island area. Catches have been generally good, and the fleet has been limited mainly by the amount of fish the plants could utilize. The vessels were averaging about one trip a week throughout the quarter. Two local plants ceased handling finfish during the shrimp season, but one had resumed canning petfood by the middle of September.

EFFECT OF PESTICIDES ON MARINE ORGANISMS: Determination of median tolerance limits for various insecticides was continued this quarter with most of the emphasis on brown shrimp (*Penaeus aztecus*) which were abundant locally from May through August. Since August, studies have been shifted to white shrimp (*P. setiferus*), blue crabs (*Callinectes sapidus*), pinfish

(*Lagodon rhomboides*), golden croaker (*Micropogon undulatus*), and spot (*Leiostomus xanthurus*). New chemicals tested this quarter include TDE (DDD), Methoxychlor (DMDT), Sabane, Rotenone, and Nemagon, all of which were less toxic to shrimp than most of the chlorinated hydrocarbons tested, such as Dieldrin, Heptachlor, DDT, Endrin, BHC, and Aldrin. Thus far, studies have been confined mainly to the chlorinated hydrocarbon group of pesticides. Work with the organic phosphates is pending the installation of a fume hood and acquisition of other safety equipment.

Note: See Commercial Fisheries Review, February 1960 p. 36.



Hawaii

COMMERCIAL FISHERY LANDINGS, JULY 1959-JUNE 1960:

Commercial fisheries landings of sea and pond fish in the State of Hawaii during the fiscal

Table 1 - Hawaiian Commercial Fishery Landings
and Ex-Vessel Value, July 1959-June 1960

Species		Quantity	Value
English Name	Hawaiian Name	1,000 Lbs.	US\$ 1,000
Ocean Catch:			
Amberjack	Kahala	75	22
Big-eyed scad	Akule	245	174
Dolphin	Mahimahi	102	52
Goatfish	Weke-ula	126	74
	Weke Moano Kumu		
Crevailles	Ulua Omilu	86	39
Mackerel	Opelu	208	82
Snappers:			
Gray	Uluk	44	21
Pink	Opakapaka Kalekale	108	57
Red	Ulaula koae, ehu	60	53
Swordfishes, sailfishes pearlfishes, & marlins			
A'u & A'u lepe		693	186
Tuna & tunalike fish:			
Albacore	Ahipalaha	11	2
Big-eyed bluefin		1,403	598
Yellowfin	Ahi	454	165
Skipjack	Aku	10,196	1,259
Bonito	Kawakawa	5	1
Shellfish:			
Crabs	Kona, Papai, Samoa	11	6
Limpet	Opihi	18	8
Lobster, spiny	Ula	13	8
Octopus	Hee	5	3
Squid	Muhee	5	2
Other fish & shellfish		316	125
Total Ocean Catch		14,184	2,937
Pond Catch:			
Clams	Olepe	2	1
Crabs	Kuakonu, Papai	6	3
Milkfish	Awa	16	6
Mullet	Aamaa	47	40
Other species		13	7
Total Pond Catch		84	57
Grand Total		14,268	2,994

year July 1959-June 1960 amounted to 14.3 million pounds, valued at \$3.0 million ex-vessel, according to the Hawaiian Division of Fish and Game. Landings of tuna made up 84.6 percent of the quantity and 67.6 percent of the value of all fishery landings. Skipjack tuna was the most important species landed.

The Island of Oahu accounted for close to 10.9 million pounds (valued at about \$2.3 million), or about 76.7 percent of the quantity and 76.4 percent of the total value of all landings of sea and pond fish and shellfish in the fiscal year ending June 30, 1960. The Island of Hawaii was the second most important center of Hawaii's fishing industry and accounted for 15.3 percent of both the total landings and their value. Landings of commercial fish and shellfish in the Islands of Maui, Lanai, Molokai, and Kauai were quite light.

Table 2 - Hawaiian Commercial Fishery Landings
by Islands, July 1959-June 1960

Island	Sea Catch		Pond Catch		Total Catch	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000
Hawaii	2,184	458	2	1	2,186	459
Maui	891	139	-	-	891	139
Lahai	13	5	-	-	13	5
Molukai	13	7	8	5	21	12
Oahu	10,863	2,235	74	51	10,937	2,286
Kauai	220	93	-	-	220	93
Total	14,184	2,937	84	57	14,286	2,994

Landings of commercial fish and shellfish in the Hawaiian Islands during July 1959-June 1960 by months were heaviest during the summer and early fall months. The July-October 1959 period accounted for 56.2 percent of the total landings. July 1959 alone accounted for close to 19.2 percent of the total landings. Landings of commercial fish and shellfish in the Hawaiian Islands are dominated by the seasonal availability of skipjack tuna. The fishery for tuna is the most important fishery in the Islands.

Table 3 - Hawaiian Commercial Fishery Landings
by Months, July 1959-June 1960

Period	Sea Catch		Pond Catch		Total Catch	
	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000	1,000 Lbs.	\$1,000
1959	2,739	391	6	3	2,745	394
July	2,101	323	6	4	2,107	327
Aug.	1,668	287	9	6	1,677	293
Sept.	1,480	278	6	3	1,486	281
Oct.	953	203	7	5	960	208
Nov.	558	241	17	13	575	254
Dec.						
1960	441	141	12	10	453	151
Jan.	448	167	6	5	454	172
Feb.	690	219	3	1	693	220
March	816	220	4	3	820	223
Apr.	1,180	229	5	3	1,185	232
May	1,110	238	3	1	1,113	239
June						
Total	14,184	2,937	84	57	14,268	2,994

Note: See Commercial Fisheries Review, May 1960, p. 25.

Industrial Fish as Food for Ranch Mink

The United States ranch-mink industry in 1958 was composed of approximately 6.5 million animals, including breeders and pelters. It is estimated that the 1960 herd size will increase by 10-15 percent to over 7.0 million mink. Three-fourths of the mink production is concentrated in the Great Lakes states and adjacent Midwest states, with Wisconsin producing almost four times as many animals as any other state. Western and Pacific Northwest states account for 15 percent of the production, with most of the remaining 10 percent accounted for by the New England and Middle Atlantic States.

Fish, including the nonmarketable species for human consumption and scrap fish from fish-processing plants, provide an economical and highly nutritious source of feed for ranch mink. Mink ranchers can be expected to use an estimated 256 million pounds of fresh and frozen fish and fish scrap in 1960.

Area	Average Level of Fish in Ration		Estimated Consumption of Fish Million Lbs.
	%		
Great Lakes & Midwest States	25		164
West & Pacific Northwest	50		66
Atlantic Coast	30		26
Total			256

This is based on an average total feed consumption of 125 pounds per animal annually. In addition, a limited amount of fish meal is used--some in the cereal portion of the rations and a lesser amount as a replacement for fresh fish. An estimated 2.5 million pounds of fish meal will be utilized in mink rations during 1960.

In the Midwest between 40 million and 50 million pounds of the fish used will be of fresh-water origin, composed of sheepshead, carp, smelt, bloater chubs, tullibees, lake herring, alewives, yellow perch and pickerel fillet scrap, and miscellaneous species. Salt-water fish used by Midwest ranchers will include whole whiting and hake, cod and flounder scrap, miscellaneous species from the Atlantic Coast; croakers and a conglomerate of species from the Gulf of Mexico; and sole and rockfish scrap from the Pacific Northwest states. Western ranchers utilize whole fish composed of various species of sole and rockfish not used for human consumption, either because of their small size or limited markets, and a few miscellaneous species. Waste from West Coast fillet-processing industries is exten-

sively used for mink feed. Some croakers are used by Colorado and Utah ranchers. Atlantic Coast ranchers make use of whiting and hake; cod, flounder, and other fish-processing scrap; and whatever species of whole fish are available to them locally.

Most of the fish is distributed to ranchers through feed dealers and mink ranchers' co-ops. This is generally true throughout the United States. Ranchers who have the freezer capacity, do take advantage of local sources of fish. The trend in the Midwest is toward a ready-mixed complete ration, either frozen and delivered to ranchers by feed dealers, or delivered ready to feed from co-ops.

The price the rancher pays for fish frozen and delivered to the ranch averages about \$4.50 a hundred pounds. Some ranchers may pay as much as \$6.00 for preferred species, or as little as \$2.00 for thiaminase fish and fish scrap. Costs of freezing, packaging, handling, transportation, and brokerage fees average about \$2.25 a hundred pounds. There is, of course, considerable variation in this cost, depending on the circumstances and efficiency of operations. Fish from the Atlantic Coast and the Gulf can be delivered frozen into Chicago at \$3.50-\$4.00 a hundred pounds.

Fish produced for mink feed must be of a quality almost equivalent to fish used for human consumption. This point cannot be overemphasized. Fish should be iced aboard the vessels and in the plants until frozen. The fish should be packaged in 50-pound containers, either boxes or bags, of no greater than six-inch thickness and quick-frozen, preferably at -20° F. Cold storage should be at -5° F. Fish which contain the thiaminase factor should not be included with other fish unless all the fish are to be cooked or treated to destroy the enzyme.

The mink-food market for fish can be expected to increase, particularly if efforts are maintained to keep the quality of fish high. This increase can be accelerated through research into methods of making greater use of present abundant sources of thiaminase fish, through research into ways to reduce feed costs and increase profits, and through increased use of fish in mink rations.

--Walter C. Jones,
Fishery Marketing Specialist,
Division of Marketing,
Bureau of Industrial Research,
U. S. Bureau of Commercial Fisheries,
Ann Arbor, Mich.



North Atlantic Fisheries Investigations

DISTRIBUTION AND ABUNDANCE OF GROUND FISH IN THE INSHORE NURSERY AREAS SURVEYED:

M/V "Capt. Bill III": A 5-day cruise (the second of a series), by the chartered fishing vessel Capt. Bill III was made late in August by fishery biologists of the U. S. Bureau of Commercial Fisheries to determine the distribution and abundance of bottom fish inhabiting inshore waters, especially small haddock which might be taken by unregulated boats using small mesh trawl nets. The survey was made in the vicinity of Cape Cod and the Massachusetts Bay area between Cape Ann and the Isles of Shoals.

Thirty-two different kinds of fish were taken in the 30 tows. Haddock and cod were the most abundant of the food fish, and dogfish far outnumbered the noncommercial fish taken. Several schools of tuna were sighted in various parts of Cape Cod Bay during the 5-day period. The haddock data will be used in a study of the extent of nursery grounds at this season of the year.

A special collection of dogfish was made for the University of Cambridge, England.

Note: Also see Commercial Fisheries Review, Sept. 1960 p. 25.



North Pacific

Exploratory Fishery Program

GOOD TRAWLING BOTTOM FOUND OFF BRITISH COLUMBIA:

M/V "John N. Cobb" Cruise 47: A relatively large clear area of about 60 square miles of trawlable ocean-bottom was found northwest of Triangle Island by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel John N. Cobb. Catches of 3,000 pounds of rockfish and from 200 to 700 pounds of Dover sole per hour tow were commonly made in the area at depths from 75-115 fathoms. Good catches of rock sole and true cod were obtained at depths from 50-75 fathoms. The vessel returned to Seattle September 9, 1960, completing an 8-week exploratory bottom-trawling cruise off British Columbia.

Several small patches of clear dragging bottom were found south of the Scott Islands

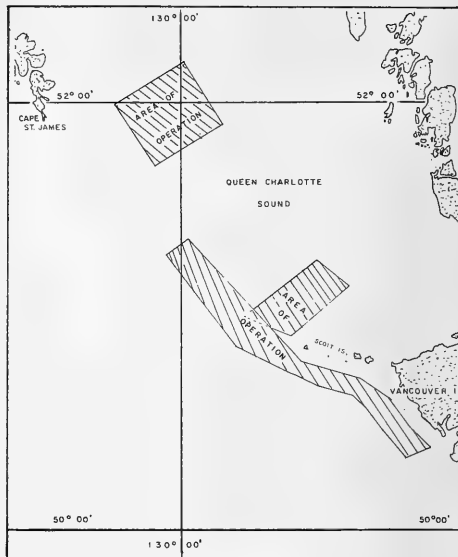


Fig 1 - M/V John N. Cobb Cruise 47 (July 18-September 9, 1960).

where the commercial trawl fleet had previously been unable to fish. Good catches of rockfish and Dover sole were taken in that area.

Only a small patch of clear bottom was found in the limited time available for surveying the Queen Charlotte Sound region. As precise radio bearings are difficult to obtain in that area and it is too far from shore to obtain radar fixes from coastal promontories, commercial trawlers would probably not be able to position themselves accurately enough to utilize this restricted ground. Future work to extend the survey thus seems advisable for that region.

Soundings shown on charts for the areas investigated northwest of Triangle Island and in Queen Charlotte Sound were scanty and often in error. Special efforts were therefore made during the cruise to compile extensive and accurate soundings. The soundings will be summarized and distributed to the trawl fleet to facilitate their fishing operations.

Locations of the delineated clear areas and catches obtained were communicated to

the trawling fleet directly, and through their association representatives as soon as the survey work was complete in each area.

The procedure used to survey the area was as follows: (1) Sounding transects, using a high resolution research model echo-sounder, were made approximately two miles apart and at right angles to each other. The character of the bottom with respect to hardness was plotted during the sounding transects as were the definitely untrawlable stretches. (2) The promising sections within the soft bottom areas were then surveyed using a snag cable 280 feet long between standard 8-foot by 4-foot otter doors. (3) On snag cable tows coming clear a standard 400-mesh eastern otter trawl was towed to evaluate the species and magnitude of fish populations present.

A total of 129 stations including sounding transects, snag cable tows, and otter trawl tows were made during the cruise.

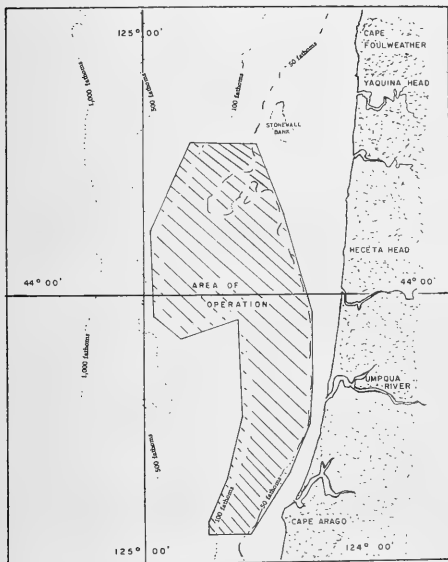


Fig. 2 - M/V John N. Cobb Cruise 48 (September 26-November 5, 1960).

M/V "John N. Cobb" Cruise 48: The John N. Cobb departed Seattle on September 26, 1960, for 6 weeks of exploratory shrimp fishing between Coos Bay and Newport, Oreg., in cooperation with the Oregon Fish Commission.

Biologists from the Fish Commission were aboard during the entire cruise and participated in all phases of the operation. The primary purpose of the cruise was to delineate commercial shrimp grounds.

Oregon

HATCHERY-PRODUCED SALMON SUPPLEMENT NATURAL SPAWNING:

Salmon and steelhead releases from 16 Oregon Fish Commission hatcheries for the first six months of 1960 totaled more than 42 million fingerlings. The releases were made, according to the Director of Fish Culture, as a supplement to natural fish stocks. The hatcheries are located on key rivers throughout the state.

Coastal rivers received 1,755,000 fingerlings of which 105,000 were steelhead, 309,000 fall chinook, 226,000 chums, and 1,114,000 silver salmon.

The main Columbia River and small tributaries received 26,000 spring chinook, 31,696,000 fall chinook, 103,000 steelhead, 1,230,000 chums, and 2,656,000 silver for a total of 35,711,000 fish.

Willamette River was stocked with 4,663,000 fingerlings. Contributions to that area were 3,935,000 spring chinook, 201,000 fall chinook, 528,000 steelhead, and 3,770,000 silvers.

"All of the silvers, spring chinook, and steelhead were released as yearlings from 4 to 6 inches in length," the Director of Fish Culture stated. "Chums were released as unfed fry and fall chinook were fed up to 90 days to correspond with natural migration habits of these species. The silver salmon yearlings included in the stocking program were from the 1958 brood and will return as adults to the sport and commercial fisheries in the summer and fall of 1961.

"The chinook fingerlings, also the 1958 brood, will return to the rivers in 1962 and 1963. Steelhead normally spend one or two years in fresh water and two or more years in the ocean, and will return during the winters of 1962 and 1963."

A new hatchery diet in pellet form was fed to all 1958 brood silvers and 449,000 of the spring chinook. Healthy, well-fed fish

are the result of feeding the new moist pellet developed by the Oregon Fish Commission and the Astoria Seafoods Laboratory of Oregon State College. The custom-made pellets contain tuna and salmon viscera and other fish products combined with meals and vitamin supplements to form the complete fish diet in one easy-to-handle form. An estimated 500,000-600,000 pounds of pellets will be fed during fiscal 1961 to fish in the hatcheries now.



Oysters

LONG ISLAND SOUND OBSERVATIONS ON SPAWNING AND SETTING:

As of August 31, 1960: During the week preceding August 31, 1960, the bottom water temperature of the oyster-producing section of Long Island Sound ranged between 70.5° F. and 74.5° F. The water was relatively clear, showing no dinoflagellate blooms.

Since August 23, the number of mature oyster larvae per sample remained relatively constant at one station, but showed a pronounced increase at another station. However, at still another station larvae were still uncommon. It may be of significance, nevertheless, that, although at the one station where the number of oyster larvae remained approximately the same, the total number of bivalve larvae increased more than tenfold, perhaps indicating generally favorable conditions for the existence of these organisms.

As was predicted, setting of oysters became heavier August 25 to 29. The heaviest setting occurred at one station located at a 20-foot depth in the Milford area and one station at a 30-foot depth in Bridgeport. Five other stations indicated a setting that may be of commercial importance, but 3 stations registered only a light and scattered setting.

Since a high percentage of oyster spat found on the collectors on August 29 was one-day-old or younger, the setting was expected to continue for several days. This is especially true in the region of one station where the number of mature oyster larvae significantly increased.

As the situation appeared at the end of August, it was rather probable that, during this summer, certain sections of Long Island Sound had already obtained an oyster set of commercial magnitude. Whether this set will survive combined attacks of drills, starfish, and flatworms (*Stylochus*) will depend upon the distribution and occurrence of those enemies and the control measures employed by the industry.

Setting of starfish continued but was still extremely light. Examination of the last set of collectors revealed the presence of one starfish spat per 40 shells at two stations. (Bulletin No. 6, August 31, 1960, U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.)

As of September 15, 1960: During the first ten days of September 1960 the bottom water temperature of the oyster-producing sections of Long Island Sound remained relatively steady, averaging between 72.0° F. and 73.0° F. However, hurricane "Donna" on September 12 somewhat reduced the temperature which on the day after the storm, ranged between 66.5° F. and 69.0° F.

Early in the month some mature oyster larvae were encountered in the plankton samples but, in general, their number began to show a decrease toward mid-September. On September 13 no oyster larvae were found in any of the samples. It is of interest, nevertheless, that the number of bivalve larvae other than oysters, mostly of the coot clam (*Mulinia*), was greater in the samples taken at all stations the day after the hurricane than in the collection made on September 9.

Larvae of the flatworm, possibly *Stylochus*, were encountered in the samples early in September and continued to occur in comparatively large numbers. A heavy setting of these oyster-killing worms has been recorded on spat collectors from Milford Harbor and Long Island Sound proper.

Setting of oysters continued during the first two weeks of September. Heaviest set was recorded at the same station where the largest number of mature larvae occurred in the samples collected on August 29. One station located on the State spawning bed in New Haven was the second best but, at one station, the intensity of setting sharply decreased, regardless of the fact that on August 29 the number of mature oyster larvae in that area was still considerable.

Examination of the collectors brought in on September 13 showed only a few spat. Some of them were only one day old, thus having set on the day of the hurricane. Considering the lateness of the season and almost total absence of oyster larvae in plankton samples, it is rather improbable that another wave of heavy setting of oysters will take place in Long Island Sound.

Setting of starfish virtually ceased. (Bulletin No. 7, September 15, 1960, U. S. Bureau of Commercial Fisheries Biological Laboratory, Milford, Conn.)

* * * * *

UPPER CHESAPEAKE BAY ESCAPED MSX MORTALITY IN AUGUST:

Scientists, who are working on the new mortality in Delaware and Chesapeake Bay, predicted that May, June, August, and early September were critical periods in which mortalities, presumably from MSX, could be expected. Oyster planters and state officials were watching the oysters anxiously in the areas adjacent to the known points of infection as well as areas where the mortalities occurred last fall and spring.

It appears, from reports from growers and packers, that heavy mortalities were not experienced in many areas heretofore free from MSX. The notable exception was losses of 15 to 30 percent of oysters planted off the mouth of the Rappahannock.

Since that area is relatively close to the area of heavy losses in the Bay off Mobjack, it appears that there has been little expansion of the zones of heavy damage. Even in the areas where 50 to 75 percent mortalities were found last year, the rate of losses,

appear to be substantially less than last year, and far less than is taking place in the same oysters placed on experimental test trays. No explanation can be made of this difference at present.

The zones of high mortality in lower Chesapeake still are confined to the western side of the Bay from off the Rappahannock River to the mouth of the Bay, to Mobjack Bay, the lower York River, and the lower James River.

Oysters in the James River seed area still are free from MSX, according to the Head of Shellfish Investigations of the Virginia Fisheries Laboratory. A shellfish biologist reports some mortality in Holland Straits of adult oysters, but explains that they are heavily infested with Dermocystidium, which might account for the losses.

* * * * *

SET BEST ON SHELLS SUSPENDED ON RACKS:

An experiment conducted in 1959 in the Cape Cod, Mass., area by biologists of the U. S. Bureau of Commercial Fisheries indicated that oysters set preferably on shells suspended on racks rather than on shells placed in bags on the bottom. The higher density of set on suspended shells was attributed to greater silting of bottom shells. This summer the experiment was repeated and bottom shells were flushed regularly and remained clean; still the oyster set on suspended shells was 3 times greater than on the bagged shells on the bottom.



Radiation Preservation

ARMY TO BUILD RESEARCH CENTER AT NATICK, MASS.:

An Army Quartermaster Research Facility, designed specifically for use in connection with the Army's irradiated food program, will be constructed at the Quartermaster Research and Engineering Center, Natick, Mass. It was announced on September 8, 1960, by the Department of the Army.

The research facility will be geared directly to the needs of a recently-announced revised six-year, \$5 million Army program to accelerate research on specific irradiated foods for military use. The facility will include a megacurie Cobalt-60 source, a 24 MEV linear accelerator, and a supporting food preparation laboratory.

The research facility will be built in lieu of a full-scale production plant, originally planned to be constructed at Stockton, Calif. Construction of the Stockton plant was suspended in October 1959 pending further laboratory studies to determine the feasibility of radiation as a practical means of food preservation. The Natick facility will assist in these studies.

Much of the planning and equipment developed for the original Stockton plant at a cost of \$1.3 million dollars will be adapted for use in the Natick facility. It is estimated that an additional \$1.8 million will be required to establish the Natick facility.

The new facility is expected to be operational in about two years. The facility will be made available for use by other agencies working in this field.

Location of the facility at Natick was determined on the basis of a detailed survey conducted by the Army. The Army received technical assistance from the Atomic Energy Commission. It also was invited from the Departments of Agriculture, Commerce, Interior, State, and Health, Education and Welfare, together with the International Cooperation Administration, and the Small Business Administration. All of the above agencies are members of the Interdepartmental Committee on Radiation Preservation of Food, formed in 1956.

The Army study considered such factors as operational efficiency for maximum utilization by all users, site development, construction costs, product availability, and proximity of highways, railways, airways, and related transportation.

The Army program, which is administered by the Quartermaster General, concentrates on total sterilization to preserve food for long periods of time. This aspect of irradiated food is of greatest interest to the military. The Army program is being closely coordinated with a civilian research program being developed by the Atomic Energy Commission (AEC) and with the Interdepartmental Committee on Radiation Preservation of Food. The AEC program will concentrate on low-dose radiation processing of perishable food to extend shelf life.

Note: Also see Commercial Fisheries Review, May 1960 p. 29, Mar. 1960 p. 37, Oct. 1959 p. 16.



South Atlantic Exploratory Fishery Program

SCALLOP AND SHRIMP RESOURCES SURVEY OFF FLORIDA EAST COAST PLANNED:

M/V "Silver Bay" Cruise 26: The U. S. Bureau of Commercial Fisheries chartered fishing vessel Silver Bay was scheduled to

leave Brunswick, Ga., on October 18, 1960, to make a 5-week survey of the scallop and shrimp resources off the coast of Florida, between Cape Canaveral and Key West.

Due to the number of requests for another series of scallop-dredging demonstration trips, similar to the series conducted in June this year, daily trips from Ft. Pierce, Fla., were scheduled for October 19-21. Interested persons were invited to accompany the Silver Bay.



Tuna

U. S. BIOLOGIST ACCOMPANIES NORWEGIAN SURVEY CRUISE OFF WEST AFRICA:

A U. S. Bureau of Commercial Fisheries biologist from the San Diego, Calif., Biological Laboratory staff was an observer aboard the Norwegian research vessel Johan Hjort while on a two-months cruise to African waters, which began about October 1, 1960. Ten Norwegian commercial fishing vessels accompanied the research vessel.

Purpose of the expedition was to determine if it is feasible for Norwegian vessels to develop a tuna fishery south of Dakar, West Africa.

The United States biologist studied the use of sonar equipment in locating and tracking tuna. The invitation to join the cruise came to the Bureau from the Director of the Institute of Marine Research, Bergen, Norway.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JULY 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during July 1960 increased by 6.9 percent in quantity, but were lower by 1.3 percent in value as compared with June 1960. The increase in quantity was due primarily to higher imports of groundfish fillets (up 8.4 million pounds) and frozen tuna other than albacore (up 3.7 million pounds), and to a lesser degree, an increase in the imports of fresh and frozen salmon and fresh

swordfish. The increases were partly offset by a 3.9-million-pound decrease in the imports of lobster and spiny lobster and a drop of 1.6 million pounds in the imports of frozen shrimp.

Compared with July 1959, the imports in July this year were down 1.3 percent in quantity and 6.3 percent in value due to lower imports of most of the major imported fishery products. Compensating, in part, for the decreases was an increase of about 4.3 million pounds in the imports of frozen albacore and other tuna.

Item	QUANTITY			VALUE		
	July 1960	July 1959	Year 1959	July 1960	July 1959	Year 1959
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish:						
Fresh, frozen, & processed 1/	92.2	93.4	1,070.5	25.3	27.0	309.8
Exports:						
Fish & shellfish:						
Processed only 1/ (excluding fresh & frozen)	2.1	6.2	68.0	1.0	1.4	22.6

1/Includes pastes, sauces, clam chowder and juice, and other specialties.

United States exports of processed fish and shellfish in July 1960 were higher by 38.8 percent in quantity and 25.0 percent in value as compared with June 1960. Compared with the same month in 1959, the exports this July were lower by 66.5 percent in quantity and 28.6 percent in value. The drop in exports in July this year as compared with the same month in 1959 was due to sharply lower exports of canned California sardines and squid.

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IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1960 at the 12½-percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-September 3, 1960 amounted to 32,925,519 pounds, according to data compiled by the Bureau of Customs. From January 1-August 29, 1959, a total of 31,345,084 pounds had been imported.

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IMPORTS AND EXPORTS OF SELECTED FISHERY PRODUCTS, JANUARY-JUNE 1960:

During the first half of 1960, the pattern of United States imports showed declines in some of the major commodities. Frozen groundfish and ocean perch filets, frozen tuna, and fish meal imports decreased; shrimp and fresh or frozen lobster imports increased.

Exports of fish oils exceeded the levels reached during the first half of 1959, a record year. Canned salmon and canned sardine exports were down; shrimp and squid exports were up.

Imports: GROUND FISH AND OCEAN PERCH FILETS AND BLOCKS: Imports of 32,946,000 pounds of frozen filets during January-June 1960 were 40 percent less than during the first six months of 1959. Receipts from Canada, Denmark, Norway, and Iceland were lower. Imports of frozen blocks or slabs (33,886,000 pounds) were up 25 percent. Canada supplied 44 percent of the imported fish blocks.

TUNA FRESH AND FROZEN: Frozen albacore imports of 38,971,000 pounds during January-June 1960 were 52 percent above the like period of 1959. Nearly all was received from Japan. Frozen yellowfin and other tuna imports of 69,807,000 pounds, on the other hand, declined 26 percent. Frozen yellowfin and other tuna imports from Japan were 42 percent less than during the first half of 1959.

TUNA, CANNED IN BRINE: During the first six months of 1960, imports of 6,738,000 pounds of canned white-meat tuna in brine were up 31 percent; imports of 18,156,000 pounds of canned light-meat tuna in brine were down 9 percent. Total receipts of canned tuna in brine were only slightly more than for the like period of 1959. As in the past, Japan was by far the leading supplier.

SHRIMP, MOSTLY FROZEN: Imports of 51,365,000 pounds during January-June 1960 were 3 percent higher than in January-June 1959. Supplying about two-thirds of the total, Mexico continued to account for the major part of the imports. Receipts from El Salvador were 3,241,000 pounds, more than three times those of the like period in 1959. Receipts from Japan, on the other hand, were 1,373,000 pounds or about one-fourth those of the comparable period of 1959. Imports of 1,069,000 pounds from India were down 20 percent.

LOBSTER AND SPINY LOBSTER, FRESH OR FROZEN: During the first six months of 1960, imports of northern lobsters were 14,564,000 pounds and imports of spiny lobsters were 18,475,000 pounds; both totals were higher than those of the similar period of 1959. Canada, Australia, and the Union of South Africa were the major suppliers.

SALMON, CANNED AND FRESH OR FROZEN: Imports of 12,541,000 pounds of canned salmon, nearly all from Japan, were 28 percent below those of January-June 1959. Imports of 2,632,000 pounds of fresh or frozen salmon, nearly all from Canada, were down 53 percent from those of a year earlier.

CANNED SARDINES: Due probably to reduced supplies of the domestic product, January-June 1960 imports of 5,000,000 pounds of canned sardines not-in-oil were nearly five times those imported during all of 1959. The Union of South Africa supplied 90 percent of the total. With Norway and Portugal supplying the major share, imports of 10,358,000 pounds of canned sardines in oil were 8 percent above those of the first half of 1959.

CANNED CRABMEAT AND CANNED OYSTERS: Japan supplied nearly all the canned crab meat and oysters imported into the United States. Imports of 2,978,000 pounds of canned oysters were 2 percent above those of January-June 1959. Imports of 1,246,000 pounds of canned crab meat declined sharply and were 71 percent less than those of the comparable period of 1959.

SEA SCALLOPS, FRESH OR FROZEN: During the first half of 1960, imports of 3,095,000 pounds were 85 percent above those of the similar period of 1959. The 2,744,000 pounds received from Canada were more than double those received during the like period of 1959.

FISH MEAL: During January-June 1960, imports of 66,375 short tons were only two-thirds those of the like period of 1959. Imports from Peru were 10 percent less than in 1959 and accounted for nearly one-half of the six-months' receipts; Canada supplied nearly one-third. No fish meal was received from Angola, which supplied 20,738 tons during the first half of 1959.

FISH SOLUBLES: Imports of 2,518 tons during the first six months of 1960 were only one-fourth those of the like period of 1959.

Exports: CANNED SARDINES, NOT-IN-OIL: During the first half of 1960, exports of 9,878,000 pounds were 73 percent below those of the like period of 1959. The Philippines, although the destination of more than half the exports, took 36 percent less than during the comparable period of 1959. Cuba, the second leading market in 1959, has taken only minor quantities in 1960.

CANNED SALMON: Exports of 2,583,000 pounds for January-June 1960 were 41 percent less than in the same period of 1959.

SHRIMP, FRESH, OR FROZEN AND CANNED: Canada took the major share of United States exports of shrimp products. Exports of fresh or frozen shrimp and of canned shrimp in January-June 1960, were each 1,234,000 pounds. Exports of fresh or frozen shrimp, however, were 63 percent higher than in January-June 1959; exports of canned shrimp were up 10 percent.

CANNED SQUID: During the first half of 1960, exports of 5,880,000 pounds were 15 percent above those of the 1959 period. The import controls initiated by the Philippines in April 1960, resulted in a drop in the exports to that country from 3,324,000 pounds in January-March to 434,000 pounds in April-June. Exports to Greece of 1,403,000 pounds were 25 percent less than in the comparable period of 1959.

FISH OILS: During the first half of 1960, exports of 52,820,000 pounds were 7 percent above those of the comparable period of 1959. The Netherlands and West Germany took 40,893,000 pounds. Sweden and Norway were other important outlets.

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IMPORTS OF FISHERY PRODUCTS AT NEW HIGH DURING 1959:

For the tenth straight year, the annual value of United States imports of fishery products (edible and inedible, including all types of byproducts) has set a new record high. The 1959 value of fishery products imported into the United States was \$366.5 million, a gain of 12 percent over 1958 and 85 percent above 1950. Of the total, the value of fishery products for food uses was \$311.0 million and that for industrial purposes, \$55.5 million.

The United States continued as the world's leading importer of fishery products. Imports contributed the following share to the

United States supply of selected fishery products: groundfish and ocean perch fillets and blocks--67 percent; frozen tuna--50 percent; shrimp--42 percent; fresh or frozen northern lobster--42 percent; spiny lobster--89 percent; canned crabmeat--71 percent; and fish meal--28 percent. In most of those categories, imports made a substantial gain.

In 1959, 108 countries shared in the United States market for fishery products. For countries like Japan, fishery products were an important segment of their trade with the United States. Mexico earns a large part of its dollar exchange from the sale of shrimp. Likewise, frozen fish provides considerable dollar exchange for Canada and Iceland.

Trends by Countries: Canada, Japan, and Mexico continued to be the leading suppliers of fishery products imported into the United States (table 1). Products from those coun-

Table 1 - Value of United States Imports of Fishery Products, by Selected Countries of Origin, 1956-59

Country	1956	1957	1958	1959
	(\$1,000)			
Canada	95,800	97,404	107,005	101,967
Japan	79,800	77,202	84,872	96,226
Mexico	27,815	25,248	28,005	32,869
Norway	13,620	11,144	12,087	16,405
Peru	7,320	9,167	10,907	16,374
Union of South Africa	8,039	8,554	9,332	12,090
Iceland	6,200	6,022	8,775	10,000
Denmark	2,887	3,463	5,728	8,239
Australia	6,609	7,766	7,665	8,180
Panama	4,269	6,291	5,852	6,458
Portugal	4,907	5,507	5,177	5,452
Cuba	8,158	6,282	5,542	4,810
Ecuador	2,308	3,075	3,510	4,159
Angola	742	1,046	2,065	3,023
Brazil	2,976	2,337	2,359	3,002
Netherlands	928	2,496	1,509	2,628
United Kingdom	2,033	1,540	1,787	2,388
India	1,328	1,407	1,547	2,239
France	2,273	1,139	1,169	2,230
Chile	1,673	1,130	2,007	1,282
Other	10,829	19,223	20,271	26,479
Total	281,197	297,443	327,171	366,500

Note: Value at the foreign port of shipment.

tries accounted for 63 percent of the total value of all fishery imports. Norway, Peru, Union of South Africa, Iceland, Denmark, and Australia were other leading suppliers.

During 1956-59, significant increases occurred in annual imports from many countries including Japan, Peru, and Denmark.

CANADA: During 1959, Canada was again the leading supplier of fishery products to the United States market. As usual, a wide variety of Canadian fishery products were imported. Fresh or frozen fish and shellfish accounted for the largest part.

Table 2 - Value of United States Fishery Products Imports from Canada, 1959

Product	Value
Fresh or frozen:	\$1,000
Lobster	13,802
Groundfish fillets	13,191
Fresh-water fish	11,220
Salmon	7,212
Fresh-water fish fillets	6,052
Halibut	5,714
Flounder fillets	4,176
Fish blocks	3,850
Canned lobster	4,099
Fish meal and scrap	4,776
Other fishery products	21,736
Total	\$101,967

JAPAN: The value of fishery imports from Japan reached a record \$96.2 million in 1959 (table 3).

Table 3 - Value of United States Imports of Fishery Products from Japan, 1959

Product	Value
Fresh or frozen:	\$1,000
Albacore tuna	7,787
Other tuna	12,642
Shrimp	5,051
Swordfish fillets	4,323
Canned:	
Light-meat tuna in brine	13,254
White-meat tuna in brine	4,567
Salmon	10,778
Crab meat	7,908
Pearls, cultivated	12,875
Other	17,041
Total	\$96,226

As shown in table 1, imports from Japan have steadily increased, and that country may soon surpass Canada as the leading foreign supplier of fishery products to the United States market. Various tuna products account for a major part of the trade.

MEXICO: During 1959, Mexico supplied 64 percent of the total quantity of shrimp imported into the United States. Owing to these shrimp imports, Mexico was again the third leading supplier. The value of shrimp imports was more than 5 times that of all other fishery products received from Mexico--shrimp imports were valued at \$27.8 million and imports of all other types of fishery products from Mexico were valued at \$5.1 million; total imports, \$32.9 million.

Table 4 - Important United States Fishery Products Imports from Countries other than Canada, Japan, and Mexico, 1959

Country	Product	Value \$1,000
Norway	Canned sardines	5,052
Peru	Fish meal	4,675
Union of South Africa	Frozen spiny lobster	7,897
Iceland	Groundfish fillets and blocks	6,052
Denmark	Frozen fillets and blocks	3,254
Australia	Frozen spiny lobster	7,392
Panama	Shrimp (mostly frozen)	6,259
Portugal	Canned sardines	6,623

OTHER COUNTRIES: In 1959, the most important fishery products imported from other leading suppliers included canned sardines, spiny lobsters, fillets, and fish meal (table 4).

Area of Origin: In 1959, the United States imported more fishery products from other North American countries than from any other area (table 5). The value of those im-

Area	Edible	Inedible	Total
		(\$1,000)	
North America	143,282	8,559	151,841
Asia	80,465	21,863	102,326
Europe	46,617	8,215	54,832
South America	18,253	10,807	29,060
Africa	11,801	5,521	17,322
Oceania	10,617	502	11,119
Total	311,033	55,467	366,500

Note: Value at the foreign port of shipment.

ports was \$151.8 million or 41 percent of the total. Asia, owing primarily to products originating in Japan, was the next leading source. Europe, South America, Africa, and Oceania followed in that order.

Trends by Commodities: In 1959, value-wise, fresh or frozen shrimp was again the leading commodity in the import trade (table 6). The other leading products in descending

Commodity	1956	1957	1958	1959
				(\$1,000)
Edible Products:				
Fresh or frozen:				
Shrimp	32,986	35,415	43,162	52,306
Tuna	15,337	16,765	25,377	29,728
Groundfish fillets and blocks	25,987	27,417	30,431	38,759
Lobster	34,285	36,827	35,661	38,635
Other	50,663	55,575	63,243	60,940
Total fresh or frozen	159,258	171,999	197,874	220,368
Canned:				
Tuna	14,998	17,002	16,882	21,688
Salmon	11,650	9,470	11,271	11,130
Sardines	7,110	8,957	8,564	8,370
Crab meat	5,318	6,254	6,116	7,947
Lobster	5,031	5,017	3,952	6,441
Other	13,486	14,645	15,561	17,083
Total canned	57,593	61,345	62,346	72,659
Other edible products	16,315	17,612	19,992	18,006
Inedible Products:				
Fish meal	14,518	9,717	11,335	15,884
Pearls	3,651	9,989	10,944	13,678
Other	27,862	26,781	24,680	25,905
Total inedible	48,031	46,487	46,959	55,467
Total fishery imports	281,197	297,443	327,171	366,500

Note: Value at the foreign port of shipment.

importance were fresh or frozen groundfish and ocean perch fillets and blocks, fresh or frozen lobster, frozen tuna, canned tuna, fish meal, pearls, and canned salmon.

SHRIMP: Imports of shrimp rose to record high levels during 1959. The value of imports reached \$52.3 million. The principal supplier was Mexico, but increased quantities were received in 1959 from a number of countries, including Japan, Ecuador, Panama, India, and El Salvador.

TUNA: During 1959, the value of frozen tuna imports was \$29.7 million; the value of canned tuna, \$21.7 million. Japan is by far the leading supplier of frozen and canned tuna. A significant increase occurred in imports of canned tuna from Spain and Portugal.

GROUND FISH AND OCEAN PERCH FILLETS AND BLOCKS: In 1959, imports of fresh and frozen groundfish and ocean perch fillets and blocks reached a record high of \$38.8 million. The value of the frozen fish blocks alone was \$17.0 million or more than double imports during 1956. The principal sources of imported fillets and blocks were Canada and Iceland. Other important suppliers were Norway and Denmark.

LOBSTER: Imports were of two main types of lobster, northern lobster and spiny lobster. Canada supplies nearly all the northern lobster imported. The Union of South Africa, Cuba, and Australia have been the leading suppliers of spiny lobster. Imports of fresh or frozen lobster were valued at \$38.6 million canned lobster, \$6.4 million.

FISH MEAL: The quantity imported during 1959 was valued at \$15.9 million. Peru, Canada, Angola, Union of South Africa, and Chile were leading suppliers to the United States.

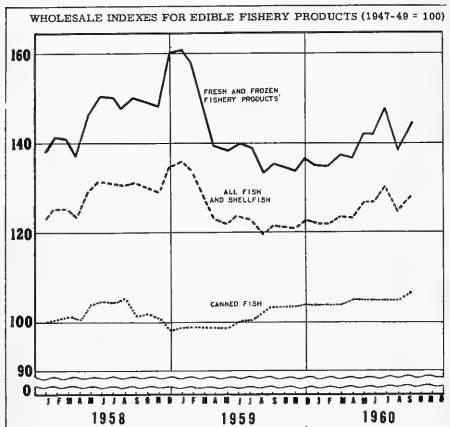
Duties Collected: Duties collected on imports of fishery products into the United States during 1959 totaled a record \$17.7 million (table 7).

Year	Duties Collected	Average Ad Valorem Equivalent
	\$1,000	Percent
1959	17,737	4.8
1958	16,645	5.1
1957	15,955	5.4
1956	15,504	5.5



Wholesale Prices, September 1960

The mid-September 1960 wholesale price index for edible fishery products (fresh, frozen, and canned) was 128.1 percent



of the 1947-49 average was up 3.0 percent from the preceding month, and up 5.3 percent from the same month of 1959. The increase from August to September 1960 was due mainly to higher prices for haddock (drawn and filleted) and the fresh-water varieties. Prices in September this year were also up from September last year due to higher prices for canned and fresh salmon and for both fresh and frozen shrimp.

The wholesale price index for the drawn, dressed, and whole finfish subgroup in September this year increased



Washing fish boxes on the Boston Fish Pier.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, September 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ (\$)		Indexes (1947-49=100)			
			Sept. 1960	Aug. 1960	Sept. 1960	Aug. 1960	July 1960	Sept. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					128.1	124.4	129.9	121.6
Fresh & Frozen Fishery Products:					143.7	138.5	147.7	134.8
Drawn, Dressed, or Whole Finfish:					169.8	158.1	165.1	169.9
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.12	.09	120.4	88.9	136.8	163.1
Halibut, west., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.31	.36	95.4	109.9	106.2	101.1
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.94	.90	210.6	202.2	198.0	178.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.74	.84	183.5	158.7	156.2	178.7
Whitefish, L. Erie pond or gill net, rnd., fresh.	New York	lb.	1.00	.74	202.3	149.7	136.6	146.7
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.77	.73	179.4	170.0	158.3	170.0
Processed, Fresh (Fish & Shellfish):					137.0	131.6	146.0	124.3
Fillets, haddock, sml., skins on, 20-1b. tins	Boston	lb.	.32	.27	108.9	90.2	154.8	117.4
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.72	.68	114.1	106.6	124.8	105.1
Oysters, shucked, standards	Norfolk	gal	7.00	7.00	173.2	173.2	173.2	151.6
Processed, Frozen (Fish & Shellfish):					110.1	112.6	117.8	107.2
Fillets: Flounder, skidless, 1-lb. pkg.	Boston	lb.	.39	.39	100.8	102.1	100.8	98.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.28	.27	87.9	84.8	84.8	102.0
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.27	.27	108.7	108.7	108.7	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.69	.72	106.5	111.5	121.5	98.0
Canned Fishery Products:					106.5	104.8	104.8	103.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	26.50	24.50	133.0	127.8	127.8	127.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.10	11.10	80.0	80.0	80.0	77.9
Sardines, Calif., tom. pack, No. 1 oval (18 oz.), 48 cans/cs.	Los Angeles	cs.	7.65	8.00	89.8	93.9	93.9	88.1
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 108 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	93.1

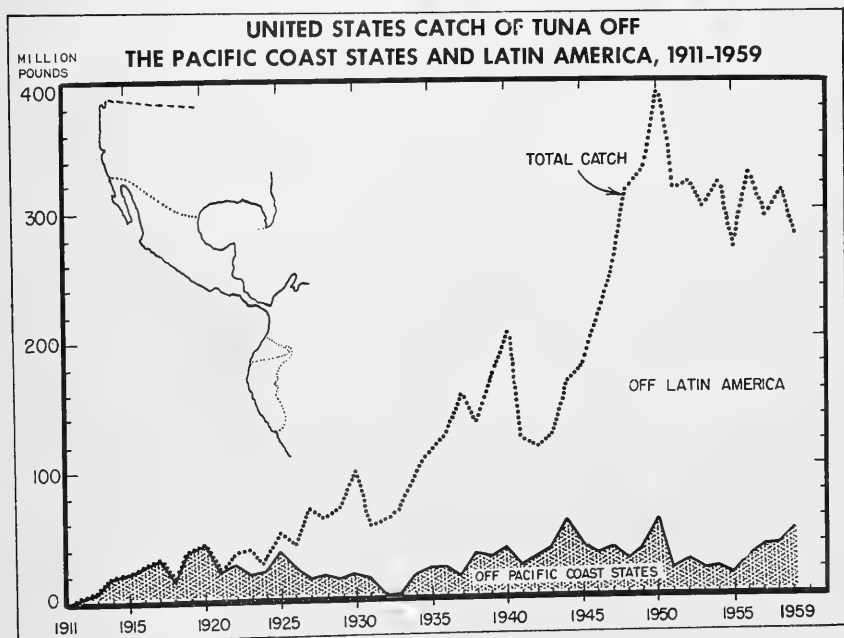
1/Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

7.4 percent as compared with August. An increase of about 35.4 percent (3 cents a pound) in ex-vessel prices for large haddock at Boston, plus a further increase of 4.2 percent in the fresh king salmon price at New York, and some increases in the prices for the fresh-water species were responsible for the increase from mid-August to mid-September 1960. Lower wholesale prices (down 13.2 percent) for frozen dressed Pacific halibut failed to offset the increases. From September a year ago to this September the wholesale price index increased 6.2 percent, due to a sharply higher price (up 17.2 percent) for fresh king salmon and higher prices for the fresh-water varieties during the Jewish holidays. These increases were partially offset by lower prices for fresh large drawn haddock (down 21.4 percent) and frozen dressed Pacific halibut (down 5.6 percent).

The fresh processed fish and shellfish subgroup wholesale index this September rose 4.1 percent from the preceding month. Lighter landings of small fresh haddock at Boston resulted in an increase of 20.7 percent in the price of small haddock fillets. In addition, the wholesale price for fresh shrimp at New York City advanced 7.0 percent. From September 1959 to September this year, the subgroup price index increased 10.2 percent due to a higher (14.2 percent) shucked oyster price and a higher (8.6 percent) fresh shrimp price. These increases were partly balanced out by a drop of 7.2 percent in the price for fresh small haddock fillets at Boston.

The mid-month September wholesale price index for the frozen processed fish and shellfish subgroup declined by 2.2 percent from August to September this year. A drop of 4.5 percent in the frozen shrimp (26-30 count) price at Chicago and a slightly lower frozen flounder fillet price were responsible for the change. An increase of about 1 cent a pound in the price for frozen small haddock fillets partially offset the increases. However, from September last year to this September the subgroup price index rose by 2.7 percent. Increases of about 2.0 percent for frozen flounder fillets and 8.7 percent for frozen shrimp more than offset a 13.8-percent drop in the frozen small haddock fillet price in September this year as compared with the same month of 1959. Prices for frozen ocean perch fillets were about unchanged from August to September this year and also about unchanged from September a year ago.

The canned fish primary price index this September was up 1.6 percent from the preceding month due to a 4.1-percent higher canned pink salmon price. Supplies of canned pink salmon from the 1960 pack are short. This increase more than offset a drop of 4.4 percent in the canners' opening price for the 1960 pack of California sardines. The lower price for California sardines is purely tentative as the new packing season was off to a slow start. Wholesale prices for canned fish this September were up 3.0 percent from September last year with the exception of the Maine sardine price which was unchanged.





International

GENERAL AGREEMENT ON TARIFFS AND TRADE

INTERNATIONAL TARIFF NEGOTIATIONS CONFERENCE OPENED SEPTEMBER 1, 1960:

Clarence B. Randall, Special Assistant to the President and Chairman of the Committee on Foreign Economic Policy, represented the United States at the opening meeting of the multilateral tariff negotiations conference on September 1, 1960, in Geneva, Switzerland. Carl D. Corse, a foreign service officer, is Chairman of the United States delegation to the conference.

William A. Vogely, Department of the Interior, is a member of the delegation at the first phase of the conference. The delegation consists of 21 representatives of United States Government agencies.

The negotiations, which are being held under the framework of the General Agreement on Tariffs and Trade (GATT), consist of two phases.

During the first phase of the conference, the United States, along with other GATT contracting parties, will negotiate with the Commission of the European Economic Community concerning the establishment of a new schedule of tariff concessions for the Common Market as a whole to replace the present individual schedules of the Member States. The United States will also negotiate, under provisions of Article XXVIII of the General Agreement, with several other contracting parties for the modification or withdrawal of individual concessions in existing schedules.

During the second phase, scheduled to begin early in 1961, the United States expects to negotiate for the reciprocal exchange of new concessions with the Commission of the EEC on behalf of the Member States (Belgium, France, Federal Republic of Germany,

Italy, Luxembourg, and the Netherlands) and at least 20 other countries which are contracting parties to the GATT or which are expected to negotiate for accession to the Agreement.

GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN

SIXTH SESSION HELD IN ROME:

Delegates from 11 Mediterranean countries plus observers from four international organizations met at the Rome headquarters of the Food and Agriculture Organization (FAO) September 22-28, for the sixth session of the General Fisheries Council for the Mediterranean (GFCM).

The delegates, representing Spain, France, Monaco, Italy, Yugoslavia, Greece, Turkey, Tunisia, Morocco, Israel, and the United Kingdom (Malta), discussed some 40 working documents and 50 technical papers prepared for the meeting and drew up the Council's program of work for 1961-1962. The working documents ranged from a paper on fishing with lights to a document on dispensing information to aid fish consumption.

The delegates, at the invitation of the Italian Government, and the observers from the Organization for European Economic Co-operation (OEEC), the International Council for Exploration of the Sea (ICES), the European Inland Fisheries Advisory Committee (EIFAC), and the International Labor Organization (ILO), visited the fishing port of Terracina and the station for fishing and mussel cultivation at Lago di Paola.

INTERNATIONAL INDIAN OCEAN EXPEDITION

The United States Government will lend support to the nation's leading oceanographers in an international expedition to the Indian Ocean. The expedition, a scientific project of extraordinary scope and magnitude, begins late this year and extends through 1964. It will greatly extend man's knowledge of these least-known waters of the world,

International (Contd.):

which cover a seventh of the earth's surface, a June 13, 1960, announcement from the White House pointed out.

Like the recent International Geophysical Year, the International Indian Ocean Expedition will incorporate a many-sided scientific attack on a single area of interest under the leadership of a special committee of the International Council of Scientific Unions, a nongovernmental organization with headquarters in The Hague. Scientific responsibility for United States participation will be borne by the National Academy of Sciences-National Research Council, national representative to the International Council.

Acting upon the recommendation of the Federal Council for Science and Technology and the Special Assistant to the President for Science and Technology, the President approved a plan calling for key contributions by the Department of the Navy and the National Science Foundation. The Navy will make available oceanographic ships sponsored by the Navy and operated by leading United States oceanographic institutions. The Foundation will be responsible for planning and coordinating Federal support for United States participation in the program including the provision of financial support.

Responsibility for planning the scientific content of the United States program has been assigned by the Academy-Research Council to its Committee on Oceanography. The Committee has expressed the hope that the Expedition, in addition to its anticipated contributions to fundamental knowledge, will afford unusual benefits to the heavily populated, protein-deficient nations on the ocean's perimeter, both in terms of increased fish harvests and in the further training of local scientists and technologists in the techniques of oceanographic research.

The Expedition's peak activity is expected to occur during 1962 and 1963 when ships and scientific personnel from well over a dozen nations will be conducting basic research in physical and chemical oceanography, meteorology, marine biology, geophysics, and submarine geology.

The problems to be studied are in the fields of physical and chemical oceanography, meteorology, marine biology, and marine geology and geophysics.

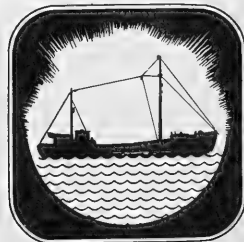
The proposed research will provide fundamental and valuable scientific knowledge. Some findings will have direct and immediate bearing on economic development and human welfare. Location of shoals and regions of upwelling will identify likely fishing areas. Studies of distribution, nature, and seasonal variation in nutrients and marine organisms will indicate what to fish for and when. Preliminary quantitative estimates of fish population, when supplemented by exploratory fishing, will suggest the magnitude of the fishery resource.

The data obtained will provide an essential part of the information on which decisions can ultimately be reached on the nature of fishery operations, markets and methods of marketing, extent of investment, and related development problems. A new source of protein could mean food for hungry people. If it came from the ocean, land and other capital devoted to protein food raising could be shifted to other uses. Marine organisms could also provide fertilizer and animal feed in areas now lacking adequate supplies.

NORTHWEST ATLANTIC FISHERIES COMMISSION

TENTH ANNUAL MEETING:

The Tenth Annual Meeting of the International Commission for the Northwest Atlantic Fisheries was opened in Bergen, Norway, on May 30, 1960, and continued through to June 3. The meeting was preceded by a meeting of the Assessment Group and by meetings of the Standing Committee on Research and Statistics and its various subcommittees, and by Groups of Advisers.



Commissioners from all 12 member countries, most of them accompanied by experts and advisers, participated in the Annual Meeting. Observers were present from Poland, from a number of International Fisheries Organizations, and from the World Meteorological Organization.

The annual revision of panel memberships resulted in an increase from 28 to 32: The Federal Republic of West Germany and the United Kingdom each taking membership in Panel 2, while Italy took memberships in Panels 3 and 4.

International (Contd.):

The Committee on Finance and Administration proposed a budget of \$59,300 for 1960/61; this budget was adopted by the Commission. The increase of over \$6,000 as compared to the previous year's budget was mainly caused by expenses for traveling of scientists to small group meetings for the completion of special tasks set by the Commission.

The 1961 Annual Meeting will convene in Washington, D. C., on June 5, 1961. The 1961 Annual Meeting will be preceded by a Marking Symposium lasting for four days. The Commission further accepted an invitation by the U. S. S. R. to convene the 1962 Annual Meeting of the Commission in Moscow.

The Committee on Research and Statistics and its various subcommittees concentrated its work on the two major tasks: (a) Fishery Assessment in Relation to Regulation Problems and (b) Environmental Studies. Under (a) the Committee considered the progress report by the Assessment Group and the steps needed for the completion of the task and recommended that the Group for this purpose should meet for two weeks in Lowestoft in February 1961. Under (b) the Committee considered which tasks should be given priority in a program for environmental studies, and it stressed the urgent need for more close cooperation between biologists and hydrographers. To achieve this it recommended that a small group of biologists and hydrographers should meet the following

year to consider problems related to environmental research, and that a Symposium on "the Influence of the Environment on the Distribution and Abundance of the Principal Groundfish in the ICNAF Area" be held in 1962 or 1963.

The Committee further dealt with problems connected with fisheries statistics, mainly those arising from the Joint FAO/ICES/ICNAF meeting in Edinburgh, with sampling of fish stocks, with gear and selectivity, and with aging techniques. It further considered the plans for the Marking Symposium to be held in 1961.

The reports of the Committee were presented by the Chairman to a special meeting of Commissioners, as well as to the Plenary, where the various recommendations were adopted by the Commission.

In meetings of the five panels and of their groups of advisers, the status of the fisheries and the researches in the different subareas was considered, and plans for future work were elaborated.

Note: Also see Commercial Fisheries Review, February 1960, p. 60.

MARINE OILS

IMPORTS BY WESTERN EUROPE
WILL DROP IN 1960:

Western Europe's net imports of whale oil and other marine-animal oils in 1960 will drop about 2.6 percent or 6,000 metric tons from the 231,000 tons imported in 1959. But Western Europe's imports of marine oils forecast for 1960 and the preliminary total for 1959 are still sharply higher than the 169,700 tons imported in 1958.

Net Imports of Marine Oils by Western Europe by Commodity and Area, Annual 1958 and 1959, Forecast 1960

Commodity	Forecast 1960			1959 1/			1958 2/		
	North-western Europe 3/	Mediterranean Countries 4/	Total	North-western Europe 3/	Mediterranean Countries 4/	Total	North-western Europe 3/	Mediterranean Countries 4/	Total
..... (1,000 Metric Tons)									
Marine oils:									
Whale oil	110	-	110	110.8	(-3.1)	107.7	126.1	(-1.1)	125.0
Other marine 5/ ..	110	5	115	117.4	5.9	123.3	39.6	5.1	44.7
Total	220	5	225	228.2	2.8	231.0	165.7	4.0	169.7
1/Preliminary.									
2/Revised.									
3/Includes Austria, Belgium-Luxembourg, Denmark, Finland, France, West Germany, Ireland, Netherlands, Norway, Sweden, Switzerland, and the United Kingdom.									
4/Includes Greece, Italy, Portugal, Spain, and Yugoslavia.									
5/Includes sperm oil and whale oil where not separately classified.									

International (Contd.):

In 1960 it is predicted that Western Europe whale-oil imports will be up about 2.1 percent, but other marine oils will drop by 6.7 percent as compared with the preliminary totals for 1959. (Foreign Crops and Markets, August 1, 1960, U. S. Department of Agriculture.)

UNITED STATES TO HOST WORLD CONFERENCE ON FISHERY PRODUCTS NUTRITION

The United States Government will serve as host to a world conference on the nutritional value of fishery products, the Department of the Interior and Department of State announced August 26, 1960.

The conference will be sponsored by the Food and Agriculture Organization (FAO) of the United Nations. Approximately 400 authorities on nutrition, representing some 80 nations, are expected to attend the conference to be held in Washington, D. C., during the last two weeks in September 1961.

In announcing the conference, Assistant Secretary of the Interior Ross Leffler said: "The world's fisheries represent one of the few natural sources of nutritionally-valuable animal protein. They constitute a rich reservoir of food for the underdeveloped and overpopulated countries of the world. This conference, the results of which may well justify the first organized steps toward systematized farming of the seas, is part of the program of our Government and the Food and Agriculture Organization to 'Free the World from Hunger'."

The conference will deal with the unique nutritional benefits of fishery products, both for human food and for animal feeding. Recent nutritional research findings by the U. S. Bureau of Commercial Fisheries have shown the importance of fishery products to the public health. The unsaturated fats in fish have been demonstrated to be most effective in reducing the elevated blood cholesterol levels commonly associated with heart diseases. Fish are the only source of animal protein food in which this type of fat is found in abundance.

Fishery products have also proved to be very useful in specialized low-sodium, low-fat, low-carbohydrate diets which are necessary for the treatment of certain disease conditions. Many findings by animal nutritionists have pointed out the value of industrial fishery products in increasing growth rates and feed efficiency in poultry.

The conference on nutritive value of fishery products will be concerned with a field of work in which the United States is conducting substantial research and in which sufficient progress has been made so that delegates from other countries will be able to profit from the results.

A great deal of work has also been done in other countries, and one of the most important tasks of the conference will be to assemble this wealth of widely-dispersed research information. So far, very little compilation of the world's research on nutritional values in fish and shellfish has been undertaken by investigators.

It is expected that several authoritative reference texts on the nutritional value of industrial and edible fishery products will be published as a result of the conference. The proceedings of the conference will also be of value to government and industry research people in planning the future direction that nutritional research on fishery products should take.

The conference will be of considerable value to underdeveloped countries, because protein malnutrition is the most serious dietary disease in the world today, affecting nearly two-thirds of the world's population. It will also provide

nutritional researchers with the opportunity to attract worldwide attention to recent remarkable findings in fishery products.



Angola

FISHING INDUSTRIES INSTITUTE OF ANGOLA CREATED:

According to press reports, a decree of the Portuguese Ministry of Overseas, published in Lisbon in the Diario do Governo, created the Fishing Industries Institute of Angola (Instituto das Industrias de Pesca de Angola). The Ministerial Decree becomes effective in Angola upon its publication in the Boletim Oficial de Angola. The Institute's headquarters are to be in Luanda with offices in Benguela and Mocamedes, the two other principal fishing centers. The Institute is to take over the responsibilities of the Federation of Fish Guilds (Federacao dos Gremios de Pesca) which by the terms of the decree is abolished.

The Institute will be active in the industry in economic, scientific, and technological matters. It is to conduct scientific studies, reorganize the industrial units, and assist in marketing. The reorganization is to be based on plans submitted by two experts who are now engaged in conducting a study of the industry. The Ministerial Decree creating the Institute is reported to provide that the Fund to Support the Fishing Industry (Fundo de Apoio a Industrias de Pesca) is to help finance the renovation and modernization of the industry.

Commenting to newspaper reporters on these changes, the Institute's president reviewed the plight of the Angolan fishing industry. He said that the fish have returned to the waters of the Mocamedes fishing district (e.g. off Mocamedes, Porto Alexandre, and Baia dos Tigres), however the 3-year decline in the fish catches of the fishing centers at Benguela and Luanda has not been broken. The Angolan fishing industry does not have a solid base. It has concentrated on producing byproducts (fish meal and oil) instead of dried and canned fish which are primary fish products. The president of the Institute also commented on the international fish-meal market and efforts to overcome the harm caused to the producers by overproduction. He is reported as having stated that the principal objective of the International Association of

Angola (Contd.):

Fish Meal Manufacturers at the present time is to conduct a study on production quotas and price fixing in the international market. (United States Consulate, Luanda, August 24, 1960.)

* * * * *

FISH MEAL AND OIL PRODUCTION AND COSTS, 1959 AND FIRST QUARTER 1960:

Angola's production of fish meal during the first quarter of 1960 of 3,465 metric tons was down sharply (about 81.2 percent) from the 18,401 tons produced in the same period of 1959. Total production in 1959 was 56,170 tons, valued at US\$6,155,000. The drop in the value per metric ton from the first quarter of 1959 to the same quarter this year was from about US\$146 to \$109, or 25.3 percent. Stocks of fish meal on hand in July 1960 (according to estimates by the Federation of Fish Guilds) were as follows: Mocamedes area: mechanized plants, 10,705 metric tons; Benguela area: mechanized plants, 830 tons; nonmechanized plants, 7,220 tons. (Note: a previous estimate was about 22,000 tons on hand in the Mocamedes area alone in July of this year.)

The drop in the production of fish oils for the January-March 1960 quarter as compared with the first quarter of 1959 was not so sharp (1,073 metric tons as compared to 1,258 tons). Total production of fish oils in 1959 amounted to 4,857 tons, valued at US\$647,000.

Prices and Costs: Small horse mackerel (carapau or Trachurus sp), mackerel (avala), sardines (Sardinha biqueirão), and "colo-colo" are the main fish species now being used to make fish meal and oil. The prices paid for these species have varied between 0.20 and 0.35 escudos per kilo (about US\$6.40-\$10.80 a short ton).

The cost of producing fish meal in mechanized plants is now 3,210 escudos (US\$111.46) per metric ton at Mocamedes and between 2,713.20 and 2,856.00 escudos (US\$94.21-\$99.17) per ton at Benguela. The cost in nonmechanized factories at Benguela is between 2,427.60 and 2,713.20 escudos (US\$84.29-\$94.21) per ton. No cost figures are available for the nonmechanized fish-meal plants at Mocamedes, but they are believed to be about the same as those of Benguela. Costs at nonmechanized plants are said to be less than those of the mechanized factories when, as now, the decreased fish catch does not permit mechanized factories to run at economic rates of production. The cost of production of fish oil at the present time is 965 escudos (US\$33.51) per metric ton.

There are no fish-meal plants under construction at the present time. The industry's preoccupation has been with the reorganization of existing facilities and not with constructing new factories.

According to the Federation, the latest July export prices of fish meal have fluctuated between 2,284.40 and 2,427.60 escudos (US\$79.32-\$84.29) a ton. (United States Consulate, Luanda, August 10, 1960.)



Australia

CANNERY PLANS TO INCREASE CANNED TUNA PACK:

An Australian fish-canning firm is going ahead with an extensive program to increase its pack of canned tuna. In a report on the company's activities, the chairman of directors stated that the company's fish canneries at Eden and Narooma have completed another successful year.

Over 3,000 metric tons of fish were processed and marketed by the canning company. Fishermen enjoyed a stable outlet for their fish with a fixed price throughout the year even though catches at some periods were of glut proportions. Last season the company reports it handled 500 tons of tuna alone.

To increase efficiency and expand production, an extensive expansion program involving the immediate expenditure of £100,000 (US\$224,600) is in progress at the Eden cannery.

New-type refrigeration machinery has been installed for the purpose of freezing fish more quickly.

Capacity of refrigerated holding tanks has been greatly increased, factory space has been extended, and new canning equipment is being added. This will also assist the stated desire of the Australian Government to reduce imports of canned fish.

As the size and number of fishing vessels continue to increase, this should insure a

Table 1 - Angola's Production of Fish Meal and Oil, 1959 and January-March 1960

Item	Jan.-Mar. 1960			Jan.-Mar. 1959			Year 1959		
	Quantity	Value		Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Escudos	US\$ 1,000	Metric Tons	1,000 Escudos	US\$ 1,000	Metric Tons	1,000 Escudos	US\$ 1,000
Fish meal	3,465	10,903	378	18,401	77,275	2,684	56,170	177,270	6,155
Fish oil	1,073	3,693	128	1,258	4,516	157	4,857	18,631	647
\$ per short ton	-	-	109	-	-	146	-	-	110

Australia (Contd.):

greater fish catch during the next 12 months.

Export of frozen tuna from New South Wales to the United States is not considered opportune. The United States is a big buyer of frozen tuna and considerable dollar earnings for Australia could be obtained from this product. But the large capital cost of additional freezing and holding equipment which would be idle for a great part of the year makes the operation unattractive.

South Australia has been able to export to the United States because of the availability of extensive freezing equipment owned by the Government Meat Exporting Works at Port Lincoln, which would otherwise be out of use at the time tuna is caught in that area. This equipment, made available on a rental basis, is not available in New South Wales.

Competition from cheaper Japanese canned fish is an ever-present threat and application for tariff protection is in process. (Australian Fish Trades Review, July 1960.)

* * * * *

TUNA TAGGING EXPERIMENTS SEEK TO DETERMINE MIGRATIONS:

Tagging of southern bluefin and yellowfin tuna and of albacore tuna was commenced off Eden on the south coast of New South Wales in October 1957 by Australia's Division of Fisheries and Oceanography. The objects of this tagging were to determine seasonal migration, the rate of growth, and the homogeneity of the stocks being fished.

At first an experimental tag was used consisting of a strip silver dart-shaped head with an attached clear nylon tube containing the message, "Reward. CSIRO Cronulla Aust. Date Length Number." Of 464 of these tags attached to tuna, only one was recovered, so it was assumed that these tags were not satisfactory and they have now been superseded by a type of tag used successfully on tuna by United States biologists. A half arrow head made of nylon fits into a red nylax tube on which is printed, "Reward. CSIRO Cronulla Aust. Length Number."

Fish to be tagged are caught by trolling, the length from tip of snout to fork of tail is measured, and the tag is attached by insert-

ing its head in the region just below the second dorsal fin where the barb holds firmly in the flesh, and the nylax tube protrudes and is thus easily seen by the fisherman who later catches the marked fish.

This tag was first used in Australia during the 1959 season when 77 of the old experimental-type tags were attached to 73 bluefin and four yellowfin tuna, and 168 of the United States type-tags were attached to 130 bluefin tuna, 35 yellowfin tuna, and 3 albacore tuna, during the period June 3, 1959, to April 12, 1960.

Four United States-type tags were recovered last season. Three of the recoveries show local movements over a period of 7 to 64 days. The fourth and most interesting recovery was made in South Australian waters about 50 miles south-west of Port Lincoln. The fish was free for 135 days and increased its length by 2.7 inches and its weight by 3 pounds.

Another interesting tag recovery during the 1959 season was made off Bermagui (New South Wales) in November. This tag was from a yellowfin tuna which had been caught and tagged from a Japanese fisheries research vessel in August 1959, about 50 miles east of Great Sandy Island, Queensland.

There is a 4 shilling (about 45 U. S. cents) reward for the return of a tuna tag with the information requested. (Australian Fisheries Newsletter, July 1960.)



Belgium

FISH MEAL AND MARINE-OIL INDUSTRY, 1959 AND FIRST QUARTER OF 1960:

Fish Meal: There are four fish-meal reduction plants operating in Belgium, with an estimated annual production of 6,000-10,000 metric tons. The bulk of the fish meal consumed in Belgium is imported and in 1959, 29,968 metric tons (valued at US\$4,766,000) were imported. During the first three months of 1960 imports amounted to 15,391 tons, valued at US\$1,899,000. Prices per short ton for imported fish meal declined sharply from a 1959 average of about \$144 to about \$112 for the first quarter of 1960. A further drop took place in April 1960, when the average price per short ton was about \$100.80.

In 1959, Peru was the principal supplier of fish meal to Belgium, with 20,491 metric tons, or 68.4 percent of total imports, followed by Norway with 6,499 tons (21.7 percent). The balance of the 1959 fish-meal imports was supplied by Angola, Denmark, the Netherlands, and several other unidentified countries. During the first three months

Belgium (Contd.):

of 1960, Peru's share of the Belgium imports of fish meal rose to 91.7 percent (14,117 tons) and Norway's share dropped to 7.7 percent (1,183 tons). Those two countries supplied 99.4 percent of the January-March 1960 Belgium imports of fish meal. The January-March 1960 average price of fish-meal imports from Peru at \$110 a short ton was down about 20.3 percent from the 1959 average price of \$132 a short ton. The January-March 1960 average price for Norwegian fish-meal imports of \$145 a short ton was 15.2 percent lower than the 1959 average of \$171 a short ton.

Marine Oils: Belgium's requirements for crude and refined marine oils of all types are estimated at about 25,000 metric tons annually. In 1959, imports of crude and other marine oils amounted to 17,906 tons, valued at about \$3,895,000. During the first quarter of 1960 marine oil imports totaled 2,608 metric tons, valued at \$584,000. Average import prices per pound for crude marine oils during the first quarter of 1960 were up about 6.6 percent

from the 1959 average. In April this year, the average price for imported crude marine oils increased to about 11.8 U.S. cents a pound, but this may be due to a higher proportion of the more expensive whale and herring oils and not an actual increase in the value of a particular crude oil.

A small quantity of Belgium's marine-oil production is exported principally to the Netherlands, West Germany, and France.

Marine oils are used in Belgium by refining into hard-ened fats (sulfonation), for the manufacture of certain types of inks and dyes, and some types of lubricating compounds.

Import Duties and Fees: There are no import duties or quantitative restrictions on imports of either fish meal or marine oils. A sales tax of 8 percent on fish meal and 5 percent on fish oil is assessed on both imported and domestic products. (United States Consulate, Antwerp, August 4, 1960.)

Table 1 - Belgian Imports of Fish Meal and Oil by Country of Origin, 1959 and January-March 1960

Item and Country	January-March 1960				1959			
	Qty.	Value		Average Price Per Short Ton	Qty.	Value		Average Price Per Short Ton
		Metric Tons	BF 1,000	US\$ 1,000		US\$	Metric Tons	BF 1,000	US$ 1,000	US$
Fish Meal:								
Peru	14,117	84,935	1,703	110	20,491	155,925	3,120	138
Norway	1,183	9,413	189	145	6,499	60,967	1,220	171
Angola	-	-	-	-	967	7,362	147	138
Denmark	-	-	-	-	903	7,512	150	147
Netherlands	-	-	-	-	500	2,212	44	101
Other Countries ...	91	367	7	73	608	4,224	85	126
Total	15,391	94,715	1,899	112	29,968	238,201	4,766	144
				Average Price Per Pound				Average Price Per Pound
				U.S. Cents				U.S. Cents
Fish Oil (crude):								
Japan	1,139	12,949	260	10.4	8,600	87,812	1,757	9.3
Netherlands	853	8,748	175	9.4	4,494	44,888	898	9.1
Falkland Islands ...	-	-	-	-	2,859	28,703	574	9.1
Other Countries ...	403	3,674	74	8.3	1,386	12,836	257	8.4
Total	2,395	25,371	509	9.7	17,339	174,239	3,486	9.1
Fish Oil (other than crude) 1/:								
Norway	93	1,171	23	11.5	283	2,923	58	9.4
Japan	40	1,258	25	28.4	113	4,946	99	39.6
Netherlands	43	459	9	10.0	70	955	19	12.5
France	-	-	-	-	36	760	15	19.1
Other Countries ...	37	900	18	22.2	65	888	18	12.5
Total	213	3,788	75	16.2	567	10,472	209	16.8

1/Probably includes liver oils and other highly-refined oils.

Note: Values for January-March 1960 converted at rate of 49.86 Belgium francs = US\$1.00.

Values for 1959 converted at rate of 49.98 Belgium francs = US\$1.00.



Brazil

JAPANESE-BRAZILIAN TUNA FISHING COMPANY REORGANIZED:

The Japanese-Brazilian tuna fishing company operating out of Brazil has been reorganized. The Japanese firm has taken over 100 percent of the investment and changed the official prices of tuna. Through the change, the Japanese firm has obtained net proceeds of US\$83,333 up to the present time, and yearly net proceeds of \$194,444-\$222,222 are thought to be assured.

The wholesale tuna price of the joint company was \$188 a metric ton on the average, but the official price has been revised to \$301 a ton (\$377 at retail).

The set-up of the enterprise has been changed so that the entire investment of 45 million cruzeiros (about US\$180,000) by the local interests became the Japanese firm's investment. The company is said to have filed a petition with the President of Brazil for tuna fishing licenses covering ten tuna vessels.

Yearly consumption of tuna in Brazil is said to be about 15,000 tons. There are prospects that the consumption will increase. (Suisan Tsushin, June 25, 1960.)



Canada

NEWFOUNDLAND FISH MEAL AND OIL INDUSTRY, 1958-59:

Fish-meal production in Newfoundland amounted to 9,787 short tons in 1958, and 9,464 tons in 1959. Production of fish oil amounted to 889,930 Imperial gallons in 1959.

As of August 1960, the price of fish meal produced in Newfoundland was C\$81.00 (US\$78.25) per ton (60 percent protein), or C\$1.35 (US\$1.30) per protein unit f.o.b. East Coast Canadian mainland ports. Fish oil was quoted at C\$0.0825 (US\$0.0796) per pound f.o.b. East Coast Canadian mainland ports.

The majority of freezing plants in Newfoundland operated their own meal reduction plants; most of the fish meal is made from fish waste originating from fish already paid for by the processing plant. Generally, no

price is paid for small quantities of rejected fish used in meal production. In some instances, a price of C\$8.00 (US\$7.73) per ton has been paid for fish utilized in meal production. During 1959, fish-meal plants, specializing in the production of meal and oil, paid C\$10.00 (US\$9.66) per ton for fish waste. This year fish waste is being purchased at C\$3.25 (US\$3.14) a ton.

The cost of production is dependent on the volume of meal produced by a given plant. One of the largest producers of fish meal in Newfoundland has estimated costs at C\$80.00 (US\$77.28) per ton.

In 1958, 1,500 tons of fish solubles were produced, as compared with 1,800 tons in 1959.

Note: Values converted at rate of one Canadian dollar equals US\$0.966.

* * * * *

PROGRESS ON ATLANTIC COAST FISHERY STUDIES DISCUSSED AT MEETING:

Progress in fisheries science in both the biological and technological fields, particularly as to Canada's Atlantic coast fisheries, was reviewed and discussed in detail at the second "Open House" for the fishing industry conducted by the Fisheries Research Board of Canada at its Biological Station in St. John's, Newfoundland, in late June 1960.

Haddock Fishery: Canadian Biologist V. M. Hodder of the Newfoundland Station, in a review of Newfoundland's haddock fishery, said that interest in the species first developed during the war years and since then has become an important factor in Newfoundland's frozen fish industry. During the early years of the fishery, supplies were extremely good and a number of good brood years at periodic intervals continued to support the fishery at a high level until 1955. Since then, however, there has been a marked decline and scientific evidence indicates that the supply will continue to be comparatively low for some years to come.

At one time, Hodder said, the haddock catch ranked second in volume to that of cod in the Northwest Atlantic. However, the discovery and exploitation in recent years of new ocean perch grounds off Newfoundland's east coast has raised this species into second place.

He noted that there were marked differences in the growth of haddock in a number

Canada (Contd.):

of Northwest Atlantic sectors. The Grand Bank stocks, for example, grow more slowly than those on the Nova Scotia grounds and on Georges Bank off the Gulf of Maine.

The biologist related various methods employed by scientists in determining abundance, growth rates, and other biological characteristics of the species and showed how the St.

Cod Fishery: A. M. Fleming, Assistant Director of the Newfoundland Station, stressed the importance of Newfoundland's inshore fishing operations.

He noted that in the Northwest Atlantic the annual cod catch amounts to two billion pounds, taken by 12 countries. Canada's landings total 800 million pounds; followed by Portugal which takes half that quantity, and Spain and France, which each accounts



Canadian east coast schooners, equipped with Diesel or gasoline engines, fish for cod and other groundfish. Fishermen use dories to catch fish with hook-and-lines. Sail is only auxiliary.

John's Station has developed these studies to the degree where the biologists can now predict how the fishery will fare a number of years ahead.

He also discussed the discarding of small fish at sea and how the use of different sizes of mesh in otter trawl nets could allow for the escape of these fish, thus giving a proportion of them the opportunity to grow larger and be caught another time.

for 200 million pounds; other European countries together harvest 200 million pounds of cod.

Fleming produced statistics to show that half the Canadian catch is taken from the waters off the east and south coasts of Newfoundland. . . the Grand Banks yielding the biggest production. Forty-four percent of the Canadian landings results from the inshore fishery. The biggest commercial fish-

Canada (Contd.):

ery in Newfoundland is carried on by inshore fishermen.

The speaker referred to the biological factors affecting the growth, reproduction and dispersal of the cod in and around Newfoundland waters. Vitality affecting the availability of cod, especially in east coast waters, was the Labrador current, which created a layer of cold water between two warmer ones. Taking into consideration such factors as the weather, not only during the fishing season but during the preceding winter as well, and other conditions, make it extremely difficult to predict with accuracy how good the fishing should be in any year.

Fleming pointed out that there were at least four races of cod in and around Newfoundland waters, and their growth rates varied considerably. Those on the Grand Banks grow the fastest and those of Labrador the slowest.

Ocean Perch Fishery: St. John's biologist E. J. Sandeman referred to the discovery of new grounds for ocean perch in the past few years. So prolific are those grounds that they are now yielding tremendous catches to the international fleet, particularly the U. S. S. R. and Iceland. Also, ocean perch have become the second most important species in terms of volume of landings in the entire Northwest Atlantic area.

Ocean perch were of no importance commercially in Newfoundland until the frozen fish industry came into being and then their value increased in relation to the expansion of processing facilities. Sandeman showed how extensive research and exploratory fishing by the St. John's biologists resulted in the discovery of a number of ocean perch areas around the Newfoundland coast, the Gulf of St. Lawrence, and even off the Labrador coast.

Sandeman outlined the years of research into the stocks of ocean perch in east coast waters. Dealing with some biological characteristics, he pointed out that it was a very slow-growing fish, that unlike cod and other groundfish species, the ocean perch produces living young and that it has a tendency to rise into the upper water layers during the hours of darkness. Thus the best fishing times are in broad daylight.

The new ocean perch grounds off Newfoundland's east coast extend from Flemish Cap many miles north, and being virgin territory are yielding very large catches. They represent an important contribution to the food supply provided by the Northwest Atlantic fishing grounds.

Loxster Fishery: Dr. D. G. Wilder, biologist in charge of lobster investigations at the Board's Biological Station in St. Andrews, N. B., described the lobster fishery as being very intensive and competitive. Canada's over-all landings, that is, the combined catch of the Maritime Provinces and Newfoundland, amount to about 48 million pounds a year, worth about C\$18 million ex-vessel. Of that total, Newfoundland fishermen trap some 4 to 5 million pounds, valued at roughly C\$1.3 million ex-vessel.

Wilder traced the history of the Canadian lobster fishery, showing how, after early years of plenty, the lobster stocks declined drastically with the result that protective regulations became necessary to preserve the fishery. Principal Canadian regulations today are those governing open fishing seasons throughout the Atlantic region and prohibiting the keeping of undersized and egg-bearing lobsters.

Wilder traced the life history of the lobster dealing with the spawning, growth rate, and various environmental factors. He showed how fishing seasons affect the price of lobsters on the market, which in turn has a bearing on prices paid to fishermen.

Basically, the lobster is a nonmigratory animal. In the course of a year's wandering the lobster usually moves not more than a mile or two. As a result, the benefits of conservation are enjoyed by the area practicing it.

Illustrating the need for regulating the lobster fishery, Wilder said that the mortality rate among lobsters in the first couple of months of their life is 95 percent. The annual mortality rate in the adult population is 12 percent. The weight increase in a year ranges from 31 to 54 percent. It is the balance between survival rate and growth that supports size limits.

Referring to the strides that have been made in the holding and shipping of lobsters, the speaker noted that from coast to coast

Canada (Contd.):

artificial sea-water storage tanks are in use. Shipments by air, even to European markets, are made with a loss of only two percent. The largest tidal-water holding pound in the world is located in Charlotte County, New Brunswick. This pound has a capacity of 500,000 pounds and lobsters are held there for periods as long as six months. (Canadian Trade News, August 1960.)

STATUS OF BRITISH COLUMBIA EXPORT BAN ON FRESH AND FROZEN SALMON:

There is still an export ban on fresh and frozen coho or silver, sockeye, and pink salmon authorized by Section 10, subsections (4) and (5) of the British Columbia Fishery Regulations made under the Canada Fisheries Act by Order in Council of December 8, 1954 (Queen's Printer, Ottawa, 1958).



British Columbia gill-netter hauling in the net.

But there is no export ban on fresh and frozen spring or king and chum or fall salmon.

Fresh and frozen sockeye and pink salmon have been under continuous export ban since 1949. Fresh coho or silver salmon may not be exported after August 31 of each year. Prior to 1956, the export ban on fresh silver salmon applied during the whole year.

The reason for the export ban on the type and species of salmon mentioned is to encourage canning in Canada. During the record-breaking sockeye catch of 1958, exports of that species were permitted when Canadian

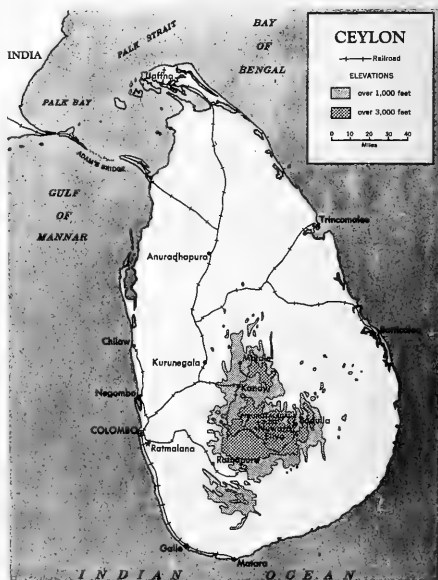
canneries reached full capacity. (United States Embassy, Vancouver, September 8, 1960.)



Ceylon

TUNA FISHERIES:

There are at least six species of tuna in Ceylon Seas. Only one of them, the skipjack ("balaya") constitutes a distinct fishery, while the remaining species are taken with other types of fish in seasonal operations using many types of fishing lines and nets. The skipjack fishery is pursued vigorously off the south and west coasts from sailing outrigger canoes ("oru"). Fishermen carry live bait in



wicker baskets which are tied to the side of the canoe so as to keep their contents flushed with sea water as the canoe sails to the fishing grounds. Redbait "hingura" is the preferred bait fish, obtained from bays and other shallow coastal areas using cast nets.

When a school of skipjack is sighted, the canoe is steered into it and each man on board

Ceylon (Contd.):

begins to fish with pole and line. At first bait fish are attached to the hook for attracting the skipjack to bite; live bait are thrown into the school for keeping the fish near the canoe and to create excitement among the skipjack to bite unbaited hooks. Angling is continued until either the canoe is filled with the catch or the school moves out of range.

ther a silver-colored fish or an artificial lure, is joined to the end of the cotton line by a short length of wire. The fast-swimming tuna are attracted to bite the spinning bait, glistening in the brightly-lit upper layers of the sea. Large yellowfin tuna, sometimes weighing as much as 80 pounds, are caught with this gear by fishermen operating off the southwest coast (Negombo to Hambantota). Other kinds of fish taken by this gear are large sharks, spearfish



Typical craft and gear used in beach-seining operations in Ceylon.

Beach seines ("madal," "karavala") which account for about 40 percent of Ceylon's fish production, encircle at times vast schools of mackerel tuna ("atavalla") and frigate mackerel ("ragudnva"). Fishing centers on the northwest coast, chiefly those between Udappu and Marawila, are reputed to make large catches, the fishermen there referring to both species as "balai." Another area of importance for "balai" landings is Trincomalee-Batticaloa. Success in obtaining a few large hauls of several thousands of these tuna enables the net owner not only to meet the entire season's operational costs but also to realize substantial profits. The profits will sometimes be large enough to help him to risk any losses during the next season on this relatively inefficient gear, limited as it is to fishing in coastal waters only.

Yellowfin tuna ("kelavalla") are obtained by trolling from sailing canoes. About 3 or 4 fishing lines are trailed behind as the canoe moves ahead. The hook, baited with ei-

("koppara"), sailfish ("thalapatha"), sier, and dolphin ("vannava").

Hand-line fishing is another method used for catching large tuna from outrigger canoes. On reaching the fishing grounds in deep water just outside the continental shelf of the south coast, 3 or 4 fishermen on board lower the sail and hand line from the slowly-drifting canoe. Each hand line is quite long and both ends carry large hooks baited preferably with squid. The ends are paid out from the opposite sides of the canoe to hang down at different depths and the entire line is controlled by one fishermen. Yellowfin weighing as much as 200 pounds each are caught; more frequently these lines take large sharks.

Fishing with drift long lines was developed by the Japanese before World War II when exploring the Pacific and Indian Oceans for albacore and yellowfin tuna. They detected abundant resources of yellowfin in tropical seas especially near the Equator but at lower levels

Ceylon (Contd.):

as large tuna tended to avoid the brightly-illuminated surface layers by day. The use of long lines is being encouraged by the Department of Fisheries within its scheme of training local fishermen. This gear seeks to catch the deeper swimming tuna, while the established trolling and pole-and-line fishing methods are designed to catch those swimming near the sea surface. Baited hooks on short lengths of fishing line (branch lines) are fastened at intervals to a very long line which is lowered to a predetermined depth in the ocean by suspending it from floats. The entire gear is allowed to drift for a few hours in the currents before it is hauled back into the boat. Depths of 100-300 feet may be fished and the catch includes, besides tuna, spearfishes, swordfish ("kodnokoppara"), and large sharks. Results of long-line fishing from mechanized boats in offshore waters around Ceylon are good and this method is growing in popularity among local fishermen.

Ceylon's production of tuna in 1957 amounted to nearly 3,500 metric tons or about 9.5 percent of the total fish landings. In the Maldiv Islands, a group of atolls situated about 450 miles west of Ceylon, the major industry is the preparation of a cured tuna product called "maldiv fish." This is derived from a large skipjack fishery using live bait with pole and line from sailing boats, a method essentially similar to the one used in Ceylon waters. About 3,000 tons of Maldiv fish are imported into Ceylon yearly. (Current Affairs Bulletin of Indo-Pacific Fisheries Council, April 1960.)



Chile

FISH MEAL AND OIL INDUSTRY, 1959:

According to latest official data (which are final), Chile's production of fish meal was 30,673 metric tons in 1959 and 18,779 metric tons the preceding year. This substantial increase (63 percent) in meal production is



explained in large part by increased fish catches in 1958 and 1959.

The current price paid for fish (anchovies, sardines and hake) used in fish-meal reduction is about US\$7 per ton and the estimated production cost of fish meal is US\$80 per ton; whereas, the price in the international market is about US\$60. Therefore, Chilean producers are operating at a loss of approximately US\$20 per ton. The difference is made up by the Government in the form of an export subsidy of approximately 40 percent.

Twenty-nine fish-meal reduction plants are presently operating in Chile, and nine additional plants are anticipated.

At present, annual production capacity is approximately 80,000 tons and it is estimated that with the construction of the 9 additional plants, capacity will increase to 100,000 tons.

The latest available fish-meal export price in 1959 was US\$120 and in 1960 US\$60 to \$80 per ton.

Exports of fish meal in 1959 amounted to 13,650 metric tons. In the preceding year, exports were 9,373 metric tons.

Country of Destination	Metric Tons
Belgium	491
Bolivia	1
Germany	3,321
Netherlands	3,327
Mexico	300
United States	5,194
Venezuela	1,016
Total	13,650

The construction of a fish-meal plant which was being built in Quintero by the United Nations and the Chilean Government for production of fish flour for human consumption has been discontinued.

According to the Chile Ministry of Agriculture, fish oil production was 1,131 metric tons in 1959 and 719 metric tons in 1958. In addition, there were produced in each of those years an estimated 100 metric tons of "vitamin fish oil" which is used for medicinal purposes. A total of 58 tons of fish oil were exported in 1959--51 tons to Italy and 7 tons to the United States.

Since Chile has sufficient production of fish meal and fish oil, it is uneconomical to import. As a measure of protection to the fish-meal and fish-oil industry, those two products are subject to an import deposit of 1,500 percent for 90 days. (July 19 and Sep-

Chile (Contd.):

tember 2, 1960, Foreign Agriculture Service Report, Santiago.)



Costa Rica

SPINY LOBSTER CATCH INCREASED SHARPLY IN SEPTEMBER:

During 1959, the spiny lobster catch in Costa Rica was negligible. The outlook for 1960, however, appears very promising as the catch out of the Caribbean port of Limon during the first part of September was very good.

It is believed that hurricane "Donna" which swept through the Caribbean may have affected materially the ocean conditions and marine life in the Caribbean because never before has such a quantity of spiny lobsters been found off the Caribbean Coast of Costa Rica. As a result, numerous citizens of Limon were busy around-the-clock building additional traps. Reportedly, within a period of two weeks, approximately CR\$10 million (US\$1,785,000) was earned by citizens of Limon from the production and sale of spiny lobsters.

The spiny lobster "invasion" was reportedly discovered through a routine scientific investigation made by two United States scientists who are in Costa Rica in connection with the conservation of the giant sea turtle. A few sharks were caught, and the contents of shark stomachs revealed them glutted with spiny lobster. This news reached the fishing community of Limon and spread rapidly. It is understood that one company in Limon has approximately 300,000 pounds in its cold-storage plant available for export.

Fearful that the present rate of catch might do serious harm to the lobster industry, the Municipality of Limon has asked the Food and Agriculture Organization (FAO), which at the present time is assisting the shrimp industry of Puntarenas, to conduct a similar study on the spiny lobster industry at Limon. It is felt that necessary measures must be adopted as soon as possible to conserve the spiny lobster population. The interest of Limon in such a conservation program is understandable as a sustained supply of spiny lobsters would be of consider-

able economic value, the United States Embassy in San Jose reported on September 14, 1960.



Cuba

CLOSED SEASON ON OYSTERS LIFTED:

The closed season on oysters (*Crassostrea rizophorae*) which was put into effect May 12, 1960, was lifted September 1, 1960, by a resolution signed by the president of the National Fishery Institute, and published in the Official Gazette of September 2, 1960.

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EXPORTS AND LANDINGS OF CERTAIN FISHERY PRODUCTS, 1959:

In 1959, Cuba exported a total of 6.5 million pounds of fishery products valued at US\$5.7 million. The high dollar to pound ratio was due to the exportation of such high-priced items as spiny lobsters, shrimp, turtles, frogs, and sponges. The chief fishery products exported were shellfish with 3.3 million pounds valued at US\$3.2 million.

Cuba's Exports of Fishery Products, 1959		
Product	Quantity 1,000 Lbs.	Value US\$1,000
Frozen:		
Fish	954	381
Crustaceans	3,285	3,234
Other	942	836
Total	5,181	4,451
Canned:		
Fish	771	463
Crustaceans	383	593
Total	1,154	1,056
Sponges	98	204
Other products	100	17
Grand Total	6,533	5,728

Among the many fishery products landed in Cuba in 1959 were 1.2 million pounds of tuna valued at US\$133,345 ex-vessel; 4.0 million pounds of bonito valued at US\$461,714; 14.2 million pounds of spiny lobster valued at US\$2.5 million; and 3.2 million pounds of shrimp valued at US\$765,702. (Mar y Pesca, August 1960.)



French South Pacific Territories

RESEARCH INDICATES GOOD TUNA FISHING POTENTIAL OFF SOUTH PACIFIC ISLANDS:

The commercial possibilities of tuna fishing in waters around French South Pacific territories are being tested by the research vessels of the French Institute of Oceania, Noumea, and U. S. Bureau of Commercial Fisheries Honolulu Biological Laboratory research vessels. From the combined data, it is now possible to draw practical conclusions of considerable importance for the eventual development of tuna fishing in these areas. Exploratory fishing undertaken by Orsom III and the vessels operated by the Honolulu Laboratory of the U. S. Bureau of Commercial Fisheries has been accompanied by intensive studies in oceanography and hydrology. The data thus obtained has been supplemented by reports received from Japanese fishing companies operating in the South Pacific region. Practical fishing trials with local long-lines showed considerable promise and the results compared favorably with other regions. In the New Caledonia area in January and May 1959, the maximum catch was 5 fish per 100 hooks with an average of 3 per 100 hooks. The average weight of the fish was 80 pounds.

As a result of the investigations so far conducted, it appears that around New Caledonia and Dependencies and around the Condominium of the New Hebrides, fishing for skipjack and yellowfin tuna and Spanish mackerel can be carried out on a small scale with trolling gear. Some of these and other species may be taken on a commercial basis with long lines. Around the islands of French Polynesia, tuna fishing with live bait is sound commercial practice.

The data so far collected emphasize the very great importance of the scientific research work carried out from the territories. Such results as are already available have indicated which are the best methods to be used according to the type of fishing intended, whether small-scale or commercial, and provide information concerning the species of fish and rate of yield, which will be of use for eventual commercial development. (SPC Quarterly Bulletin, October 1959.)



German Federal Republic

FISH MEAL AND OIL INDUSTRY, 1958-59:

Fish-meal producers in the German Federal Republic have become greatly alarmed by the recent world-wide developments in the fish-meal market. The price slump has devaluated its stocks and the industry claims that not only has it already incurred considerable losses but that it is currently operating in the red. The industry attributes these unfavorable developments to sharply increased exports of fish meal from Peru, at prices which they say they cannot meet. The industry is further disturbed by reports that Peru is planning to step up its exports in 1960 and 1961.

Table 1 - Prices of Whole Fish for Reduction, German Federal Republic, 1958-59^{1/}

Species	Annual Average Prices			
	1959		1958	
	DM Per Metric Ton	US\$ Per Metric Ton	DM Per Metric Ton	US\$ Per Metric Ton
Herring	153.59	37	172.34	41
Cod	88.33	21	136.42	32
Haddock	110.62	26	122.82	29
Coalfish	122.51	29	143.70	34
Ocean perch	126.61	30	134.87	32
Mackerel	150.21	36	143.43	34
Sprats	127.51	30	132.99	32
Sand lance	113.02	27	108.55	26
Feed shrimp ^{1/2}	120.82	29	111.24	26
Starfish 1/	47.67	11	47.74	11
All other species	88.92	21	49.83	12

^{1/}Includes feed shrimp and starfish which are dried and ground for an admixture in cattle feed; they are not used in production of fish meal.
Note: Values converted at the rate of one Deutsche Mark equals US\$0.238 (4.20 Deutsche Marks equal US\$1.00).

Fish-meal producers have tried several approaches to bar Peruvian fish meal from the German market. They have pointed out that German fish meal contains from 90-96 percent digestible protein, while Peruvian meal contains only 50-85 percent and averages much closer to 50 than 85 percent. However, requests from the fish-meal industry that the Federal Government establish a minimum rate of 90-percent digestible protein have failed because existing legislation does not permit such obligatory requirements.

The industry has also asserted that the Peruvian fish-meal industry uses "formalin" in its production, and that the chemical leaves a residue of formaldehyde in the final product. Laboratory findings have not substantiated this.

Importation of fish meal into the German Federal Republic is at present completely liberalized. In early 1960, the Government abolished export controls on fish meal. Non-purified edible fish body oil may be imported free of any quantitative restrictions. However, Government import licenses are required for purified edible fish-body oil, which comes within the purview of the marketing law. Imports of nonedible fish oil have been liberalized.

The industry has requested the Federal Government to deliberalize fish-meal imports and/or to introduce protective tariff rates. Apparently, these proposals have not been received with sympathy by the Government, and the industry claims that the Government's position is influenced politically by the farmers who, the industry claims, are saving about DM120 million (US\$28,560,000) per year on feed costs as a result of the drop in fish-meal prices. Government officials, both on the federal and state level, have confirmed that there is little likelihood of deliberalization or protective tariff measures.

One of the most recent proposals being discussed involves the application of an import levy to fish meal which

German Federal Republic (Contd.):

On August 3, 1960, the price for herring offal was to be reduced by the fish-meal plants to DM 70 (\$16.67) a metric ton.

Leading West German manufacturers have stated that the average production cost per metric ton of fish meal fluctuates between DM 280 and DM 330 (US\$67 and US\$79), the average being about DM 300 (US\$71) a ton. These figures include wages, fuel, maintenance and write-off of equipment, packing, sales tax, the manufacturer's profit margin, etc., but do not include the cost of the raw material.

Fish-meal exports from the German Federal Republic have ceased completely because of the inroads made by Peruvian fish meal in the world market. German exporters have reportedly offered their fish meal abroad at prices about 10-15 percent above Peruvian prices, but without success.

Apparently the German fish meal and oil industry is not receiving any kind of Government aid; some aid may be extended to the fishing industry.

Local trade sources point out that the decline in prices paid by the reduction industry for raw material has reduced the income of the fishing industry, fish processors, and fish dealers by some DM 24 million (US\$5,474,000) during the past twelve months. The fishing trade has already made presentations concerning the deterioration of its financial position to the Federal Government and to the governments of the coastal states. While the payment of direct subsidies to the fishing industry has been rejected by public authorities, no decisions have yet been made concerning other kinds of support, such as deferment of the amortization of government loans, the granting of additional low-interest government loans, etc.



Greece

ATLANTIC OCEAN TRAWL FISHERY EXPANSION CONTINUES:

On the occasion of a trial trip of the freezer trawler Evrudiki II, the Greek Minister for Industry and Marine Commerce praised the vessel owner for the efforts put forth in the Atlantic Ocean trawl fishery. He said, in a report in the August issue of Aleia, a Greek fishery periodical, that in the eight years since the first trip to the Atlantic banks the Greek freezer-trawler fleet had grown to 14 vessels of which 9 already were in operation. The Greek Government's support of the operation totaled more than US\$4 million while the industry had contributed \$6 million. The production of the operating vessels was about 10,000 metric tons, but was expected to increase to 16,000 tons next year when the vessels under construction came into operation.

Greek fish production in the Mediterranean and other waters has been increased with Government support and totals 80,000 tons.

Fish consumption per capita in Greece was said to be 13 kilograms (about 28.7 pounds) per year.

The only Greek freezer stern-trawling factoryship, the Evangelistria IV, has returned from her first trip with a catch of 485 metric tons of frozen fish. The new vessel, which incorporates changes from the usual construction of such vessels, performed well. Production averaged more than 12 tons daily on the banks off Northwest Africa and is expected to increase on the next trip. Its operation has demonstrated that the mechanical and construction changes were carefully developed and carried out. (Fiskets Gang, September 1, 1960.)

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FIVE-YEAR PLAN INCLUDES US\$5 MILLION FOR FISHERIES:

The Greek Economic Development Program (1960-64) provides 150 million drachmas (US\$5 million at exchange rate of 30 drachmas equal US\$1) for fish processing and freezing plants, fish hatcheries, fisheries research, and other projects. The 5-year program budgets US\$2.3 million for fish processing and freezing plants at the following ports: Piraeus, \$367,000; Thessaloniki, \$533,000; Patras (under construction), \$233,000; Cavala, \$267,000; Chalkis, \$267,000; Volos, \$233,000, plus \$100,000 for a fish collecting and storage station on Lemnos Island, and \$333,000 for a wholesale fish market at Athens. In addition, the plan provides \$1,000,000 for fish hatcheries, \$667,000 for fisheries research, and \$1,000,000 for various smaller fisheries projects. (United States Embassy, Athens, August 1, 1960.)



Iceland

CANNED SARDINES TO BE SHIPPED TO CZECHOSLOVAKIA:

A canning factory at Akureyri, Iceland, which recently increased its canning capacity considerably (present capacity 35,000 cans daily), has concluded a contract with Czechoslovakia to deliver one million cans of sardines by December 31, 1960. (United States Embassy, Reykjavik, September 2, 1960.)

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Iceland (Contd.):

FISHERIES TRENDS, FIRST QUARTER 1960:

The 1959/60 winter fishing season was more favorable even than the two good previous winters. The value of the first quarter 1960 catch was considerably greater than that of the first quarter of 1959 due not only to the larger weight landed but also to the predominance of the more valuable cod and haddock. The over-all catch during the first quarter of 1960 was substantially larger—429,355 metric tons as compared with 110,363 metric tons for the first quarter of 1959. On the other hand, the ocean perch catch, most of which goes to the Soviet Union, was only a fourth as large as for the first quarter of 1959.

Species	January - March		
	1960	1959	1958
	..... (Metric Tons)		
Cod	94,720	74,566	85,673
Haddock	13,195	8,424	10,543
Saithe	2,709	2,785	3,032
Ling	2,874	1,171	2,268
Catfish	4,232	3,304	5,121
Cusk	4,763	2,061	3,615
Ocean perch	4,271	16,667	4,792
Flounders	685	426	551
Herring	900	102	1,422
Other	1,006	857	907
Total	129,355	110,363	117,924

1/Weights are gutted fish with heads on, except herring which are whole or round.

higher income from working on the smaller fishing vessels. As a result, a number of trawlers, particularly the older ones, were laid up at the start of the season.

Incidents with British trawlers occurred during the first quarter of 1960. The Icelandic authorities accused a British trawler of deliberately destroying nets of Icelandic fishing vessels off the Snaefellsnes peninsula.

A very important trend toward free markets is noticeable in the first quarter fish export figures for 1960 as compared with the first quarter of 1959. For the latter period, 60 percent of the catch had been delivered to the filleting and freezing plants and only 33 percent was salted or dried. During the first three months of 1960, some 52 percent went for freezing, while salted and dried fish rose to 39 percent. During 1959, Iceland had been unable to meet all export demand for salted and dried fish. This demand comes exclusively from free currency markets whereas most of the frozen fish goes to the Soviet Union.

There was a considerable build-up in both the trawler and smaller fishing vessel components of the Icelandic fishing

Species	January - March		
	1960	1959	1958
 (Metric Tons)		
Motorboats	107,243	75,724	84,625
Trawlers	22,112	34,639	33,299
Total	129,355	110,363	117,924

1/All weights are of gutted fish with heads on, except herring which are whole.



Trimming and packing fillets in an Icelandic fish-processing plant.

The 12-mile limit established September 1, 1958, for trawling operations had an adverse effect on catches of Icelandic trawlers as compared with those of motor boats. The relatively poor showing of the trawlers was also due to the difficulty of finding ocean perch off Newfoundland and Greenland as compared with the first quarter of 1959. However, exports of fresh fish on ice to England continued to flourish, and this somewhat strengthened the position of the trawlers.

Another difficulty for the Icelandic trawlers was a shortage of manpower due to: (1) the failure to reach agreement with the leader of the Faroese Seamen's Union as to terms of employment as compared with the first quarter of 1959. However, exports of fresh fish on ice to England continued to flourish, and this somewhat strengthened the position of the trawlers.

fleet during the quarter. One unit added was the most modern type of trawler operated by Icelandic owners. (United States Embassy, Reykjavik, August 25, 1960.)

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FLATFISH AIR DELIVERIES TO BRITAIN STEPPED UP:

The Icelandic fishing industry stepped up the use of newly-opened flatfish grounds this summer in connection with the newly-instituted delivery by air of flatfish to Great Brit-

Iceland (Contd.):

ain and other parts of Western Europe, according to a mid-August 1960 report. By early August the areas within the 12-mile limit opened for drag-net flatfish fishing were extended beyond the Westman Islands area. With easier access to Reykjavik and its airport, it is planned to step up flatfish air shipments to Great Britain to 50 tons of fresh flatfish each week. A DC-4 carries seven tons of fish to Great Britain at a cost of 7 Icelandic kronur per kilogram (8.4 U. S. cents a pound). Fruit and vegetables are brought back on return flights.

A limiting factor is the lack of available aircraft in Iceland. Although there may be some possibility of obtaining British cargo planes, a German DC-4 has been chartered. Discussions took place recently in Reykjavik regarding the formation of an Icelandic air-cargo company to transport fish and other freight. This would be a subsidiary of the two existing airlines. Although capital is said to be available for such a company, some doubts have been expressed that a sufficient year-round volume of potential air cargo would be generated in Iceland to make it worthwhile.

This new venture has stimulated a general increase in interest in ways and means of increasing exports of fish. The possibilities of making flatfish shipments by air to the United States were examined, but profit margins were not believed to be sufficiently large.

Transportation remains the chief bottleneck to Iceland's filling British market demands for flatfish. Air transportation is still unable to meet the earlier British requirements for 50 metric tons of flatfish weekly. This demand was reported at 260 tons of flatfish weekly by air.

Shipping of flatfish by air to England and other European points began to fall off after the first week in September due principally to the failure to find profitable return cargoes for the chartered planes. Fruit brought back on these flights met customer resistance due to high prices.

Flatfish shipments by vessel to England and other European countries are continuing. English experts are instructing employees in a number of Icelandic freezing plants to fillet flatfish for the frozen fish trade.

(United States Embassy in Reykjavik, August 23, September 2 and 16, 1960.)

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NORTH COAST HERRING FISHING SEASON POOR:

Compared with last year's good north coast herring season, the Icelandic 1960 season has been poor. By August 14, 1960, 103,956 metric tons had been landed as compared with 127,537 tons for the same period last year. The portion of the catch being salted is even more unfavorable: 16,940 tons, compared with 27,163 tons for the same period of 1959. Salt herring contracts call for delivery of approximately 36,000 tons this year; and the season, according to a mid-August report, had only a few weeks to go. The lion's share of the catch went for meal and oil, but those products are being sold on world markets in very small amounts due to depressed world price conditions. Some of the inferior meal has been sold for fox feed.

On August 27, 1960, search operations for herring were ended off the north coast of Iceland as a result of a very poor season. Last year herring spotting stopped September 9. By August 29, only 126,417 barrels of herring had been salted as compared with 216,307 barrels at the same time last year. Contracts have been signed for 270,000 barrels.

This coming winter the Herring Production Board will try out new packing methods on the south coast herring in an attempt to meet specifications for the United States market.

The reduction in world prices for fish meal and oil is estimated to be the equivalent of an 8-percent reduction in Iceland's normal export earnings.

The relatively poor north coast herring season has hit fishing boat owners particularly hard due to the exceptionally heavy investments made this year for new fishing gear and fishing boats.

Icelandic newspapers reported that over 100 Soviet herring vessels were fishing off Iceland's north coast. Some of those vessels were reportedly close to or possibly even within the 12-mile fishing limit.

Iceland (Contd.):

The ocean-perch fisheries have almost come to a halt as of mid-August 1960 due to a scarcity of fish on the Newfoundland grounds and off Greenland. (United States Embassy Reykjavik, August 23 and September 2, 1960.)



Iran

SHRIMP FISHING FLEET IN PERSIAN GULF TO BE INCREASED:

According to an August 23, 1960, report from Tel Aviv, Israel, two fishing vessels are being fitted out in Haifa to participate in the Iranian Gulf of Persia shrimp fishery. The names of the vessels are Nitzan and the Leamchav. Each vessel is 83 feet in length and displaces 250 tons. Upon completion of the fitting-out period in Haifa, the two vessels will make the voyage to Iran by going around the African Continent. Present planning calls for four months in transit. The vessels will fish for shrimp for a New York City firm that has been operating in the Persian Gulf for the past two years.

agreed export price of frozen tuna for Italy in mid-August, US\$220 a metric ton c. & f. (\$180 f.o.b. delivered at Dakar) was the price at which contracts were openly concluded. But early in September shipments to Italy were lighter and Italian buyers were paying \$230 a ton c. & f. For delivery in October, large Japanese exporters claim that they are certain to be able to sell at \$230 a ton.

The price on transshipped Atlantic Japanese tuna for the United States has also firmed up. In early September the price was \$280-\$290 a ton on albacore delivered at Cristobal. (Suisan Tsushin, September 9, 1960.)



Japan

FROZEN TUNA LICENSED FOR EXPORT TO EUROPE, FISCAL YEAR APRIL 1959-MARCH 1960:

During the Japanese fiscal year (April 1959-March 1960), 36,856 metric tons (valued at US\$9,880,000) of frozen tuna were licensed

Japan: Frozen Tuna Licensed for Export to Europe, April 1959-March 1960

Months	Country of Destination				Total Quantity	Country of Destination				Total Value
	Italy	France	Yugoslavia	Other		Italy	France	Yugoslavia	Other	
	(Metric Tons)					(\$US\$1,000)				
1959:										
April	423	-	700	-	1,123	119	-	197	-	316
May	1,454	-	200	-	1,654	408	-	57	-	465
June	2,049	176	281	-	2,506	542	49	71	-	662
July	1,397	1,461	910	-	3,768	380	390	249	-	1,019
August	760	1,586	964	271	3,581	206	414	256	76	952
September	1,555	2,462	895	-	4,912	425	623	243	-	1,291
October	569	62	1,256	-	1,887	159	15	336	-	510
November	100	129	942	273	1,444	27	29	252	76	384
December	689	880	295	100	1,964	193	238	78	28	537
1960:										
January	407	1,462	1,346	-	3,215	110	381	358	-	849
February	1,446	1,623	1,831	-	4,900	387	377	508	-	1,272
March	1,212	1,145	3,245	300	5,902	335	312	890	86	1,623
Total	12,062	10,986	12,865	944	36,856	3,291	2,828	3,495	266	9,880

In addition, some vessels are also being sent overland from Haifa to Eilat. These vessels are about 60 feet in length. At least two of the vessels have been transported to Eilat and have sailed for an undisclosed port in Iran.



Italy

PRICE FOR JAPANESE FROZEN TUNA FIRMS UP:

Early in September 1960, the Italian frozen tuna market improved. Immediately after the abolition by the Japanese of the

for export to Europe. The destination of Japan's exports to Europe were as follows: Italy, 12,061 tons; Yugoslavia, 12,865 tons; France, 10,986 tons; and 944 tons to other European countries. The over-all value per ton of the frozen tuna licensed for export to Europe was about US\$268.

CANNED TUNA IN OIL EXPORTS DROP:

According to the Japan Export Canned Tuna Manufacturers Association, the export of canned tuna in oil from April-July 1960 amounted only to 72,731 cases as against 337,724 cases for the same period last year.

Japan (Contd.):

	Japanese Exports of Canned Tuna in Oil, April-July 1960	
	April-July	
	1960	1959
	..... (Cases)	
Species:		
Albacore	26,300	124,278
Yellowfin	1,531	7,536
Big-eyed	7,041	103,220
Skipjack	30,215	80,348
Flakes	7,644	22,342
Total	72,731	337,724
Principal Destination:		
Germany	22,934	122,658
Canada	16,573	67,998
The Netherlands	8,635	27,721
United Kingdom	7,150	10,150
Switzerland	6,073	26,709
Belgium, etc.	5,678	22,042
Other Countries	5,688	60,446
Total	72,731	337,724

The drop is due to the poor catches of big-eyed tuna. The pack of canned tuna in oil has been light this year.

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CANNED TUNA IN BRINE EXPORT TRENDS:

The Japanese tuna packers association, as previously reported, suspended receiving canned tuna in brine from the packers for export to the United States as of September 11, 1960. For 1960 (April 1960-March 1961) the pack of canned tuna in brine for export to the United States was fixed at 2,300,000 cases (48 7-oz. cans), but cessation of packing from September 11 reduced the quota by some 500,000 cases. For the past few years, the canned tuna in brine pack has been 3,500,000 cases per year. By the end of each August about 1,000,000 cases had been shipped, but this year the shipments were considerably less. In July the price for canned tuna in brine f.o.b. Japan was cut \$1 a case because sales were slow. By reducing exports, the industry hoped to stabilize the price.

The price difference between Japanese and United States canned tuna as of August 23 was as follows:

For United States tuna in oil, private label white meat, the price was \$12-\$12.50 a case (48 7-oz. cans) f.o.b. canners' terminal.

For Japanese tuna in brine, white meat, the price was \$11.50-\$12 a case (48 7-oz. cans) delivered to warehouse in Los Angeles.

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SHORTAGE OF CANNED LIGHTMEAT TUNA IN OIL REPORTED:

This year's Japanese skipjack tuna fishing as of the end of July 1960 was considered to be the worst in ten years and the pack of lightmeat tuna in oil for export to Europe was far short of its goal. On the other hand, lightmeat tuna in brine supplies exceed demand. It was estimated that the shortage for tuna in oil for June and July was 100,000-150,000 cases. Instead of asking for delayed shipment, the exporters were trying to settle by paying a penalty. This shows that the canners do not expect any further pack.

As of the beginning of August 1960, the prices of lightmeat (skipjack) tuna in oil in Japan were \$6.11-\$6.94 for the domestic market and \$6.20-\$6.30 a case f.o.b. for export. These prices were considerably higher than the usual market prices and since ex-vessel prices continued at more than \$175 a ton for skipjack, the packers were reported losing money.

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CANNED-TUNA-IN-BRINE MARKET POOR:

Regarding the export sale of canned tuna in brine, the Japan Canned Foods Exporters Association's standing tuna sales committee met late in August and took up the proposals made by representatives of Japanese packers. The meeting accepted the proposal that shipments scheduled for August, the sixth sale of canned tuna to the United States, be postponed until September 15, 1960. But the meeting agreed not to disclose their views on the two other proposals of the packers, which were:

(1) The export quota to the United States must be attained and the exporters' side is requested to cooperate. As for the seventh sale, it is desired to come to a thorough understanding with the expression "not to be held until the United States market conditions are stabilized." (The exporters have been requesting the packers to agree that the seventh sale will not be carried out until requested by the New York branches of the exporters).

(2) The application period of the price guarantee clause is to be 60 days for shipments going to the east coast and 40 days (30 days after arrival in the United States) for those to the west coast of the United States.

This year's Japanese canned tuna exports are extremely slow and up to August 1960, a total of 1,330,000 cases, some 630,000 cases of white meat and 700,000 cases of light meat, had been exported. Although 273,000 cases of the United States import quota at the lower rate of duty are left, the remainder Japan plans to export this year is 670,000 cases. This means there will be more canned tuna shipped to the United States in excess of the quota and subject to the higher duty than there was last year.

The Japanese industry points out that their canned tuna market situation is the worst since 1955 and to cope with the situation it is necessary to suspend sales and lower the price. The packers claim that prices have been reduced as much as possible and, as a matter of fact, there is hardly any profit at \$9.15 a case on white meat. The exporters say that they are resigned to a loss and request that the packers cooperate with them, adding that the packers should see what can be done to promote more sales. At any rate, it is generally thought difficult to sell the agreed export quantity this year.

Japan (Contd.):

At an August 27 meeting of the tuna packers association it was agreed that:

(1) Packing of canned tuna will be stopped immediately and the quantity packed but not consigned will be reported until mid-September so that its consignment will be accepted. As a result, this year's receipts for consignment or sale will amount to some 1,740,000 cases, including the nonmembers' products, and some 540,000 cases of the production quota will not be produced.

(2) Next year's allocation of pack for canners will be based on this year's pack allocation plus 7 percent of the quantity used out of the free base quota.

(3) Agreed to postpone shipments for the sixth sale until September 15.

The packers want to sell the remainder of the United States import quota at the lower duty rate in two sales, one each in September and October.

Suspension of receipts from packers by the sales company is an unprecedented emergency measure. But with present market conditions and with stocks in the hands of the sales company in mid-August at 700,000 cases, the action was considered unavoidable.

In the first six allotments sold through mid-August, 1,580,000 cases of canned tuna were sold for export to the United States. Of that amount, as of August 10, 300,000 cases remained unshipped and 500,000 cases were estimated to be unsold and in stock in the United States. Taking these 800,000 cases into consideration, the actual quantity sold and delivered to buyers totaled only 800,000 cases.

Japan had planned to fill the 2,530,000 cases of the United States canned tuna in brine import quota at the lower duty with 2,200,000 cases of Japanese pack, but as of August 22 some observers thought that 1,800,000 cases of Japanese pack would be the maximum that could be exported to the United States.

The packers also have accepted the indefinite postponement of the sale no. 7 scheduled for August. The packers' association has also tentatively agreed that acceptance by the association of consignments from members scheduled in the third part of the market year--January-March 1961, amounting to 440,000 cases--should be suspended. (The Suisan Tsushin, August 22, 23, 25, 27; Fisheries Economic News, August 30, 1960.)

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FROZEN ALBACORE TUNA CHECK PRICE DROPS:

Following the drop in the ex-vessel price of albacore tuna in California, the Japanese in mid-August 1960 announced a lower check price of US\$270 a short ton for frozen albacore tuna shipped from Japanese ports.

The check price for yellowfin tuna in mid-August was still \$230 a short ton for direct shipments from Japan. (The Suisan Tsushin, August 23, 1960.)

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FROZEN YELLOWFIN TUNA PRICE FIXED FOR DIRECT EXPORTS:

At the Japan Export Frozen Tuna Manufacturers Association director's meeting on

September 6, 1960, it was agreed that the conference price of direct exports from Japan of frozen yellowfin tuna after September 1960 should be set at \$240 a short ton f.o.b. as a base. But a suggestion that the price among shippers of Atlantic yellowfin to Italy be set at \$230 c. & f. was not approved.

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SEEK CONTROL OF FROZEN TUNA EXPORTS TO ITALY:

The Japan Federation of Skipjack Tuna Fisheries Co-ops and the Japanese Fisheries Agency have been studying the tuna market situation in Italy. Since the Fisheries Agency does not contemplate increasing the control of direct landings to Italy, the Federation has proposed certain controls for its member vessels operating in the Atlantic.

Due to modified control of exports to Italy in May, fishing in the Atlantic expanded. Due to increased landings, however, the landed price of frozen tuna at Italian ports has dropped as low as \$100 a ton. Exporters in Japan are insisting on stricter controls on direct landings or transshipments of frozen tuna to Italy. (Fisheries Economic News, August 29, 1960.)

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PROPOSAL FOR SALES COMPANY TO HANDLE FROZEN ATLANTIC TUNA EXPORTS:

At a directors' meeting of the Japan Export Frozen Tuna Manufacturers Association on September 6, 1960, the sale of Japanese Atlantic-caught tuna to Europe and the United States via intermediate ports was discussed. One of the directors pointed out the need of selling all Atlantic tuna through the Japan Export Frozen Tuna Sales Co., Ltd., the same as tuna landed at Japanese ports and exported to the United States. A unanimous resolution was passed to the effect that sales of Atlantic tuna should be handled through the sales company in Japan, including a system of purchase and of consignment, and for as long as the directors deem necessary. This proposal was to be considered at a special general meeting on September 19, in order for it to become effective. It is hoped that if Atlantic-caught tuna is systematically allocated for United States, Italian, and Japanese ports through the sales company instead of the haphazard system now practiced that a certain amount of market stability would be achieved.

Japan (Contd.):

The proposal provides for shipping Japanese frozen Atlantic-caught tuna to Japan before it is exported to Europe and the United States. Atlantic tuna sales were confronted with a crisis when prices in the Italian market declined.

The Japanese Atlantic Tuna Liaison Committee, at a meeting, discussed methods of coping with the problem and discussed shipping the excess supply of Atlantic-caught tuna to Japan as well as the tuna not suitable for export. Any loss arising from this procedure would be proportionately shared by all the operating vessels in the Atlantic based on their usual production.

Assuming that about 5,000 metric tons are to be returned to Japan and calculating ex-vessel prices in Japan, operational expenses of the vessels and transportation charges, each operating vessel would be required to assume a charge of \$3.61 a ton.

As outlined, the plan of the Atlantic Tuna Liaison Committee of the Export Frozen Tuna Manufacturers Association includes:

(1) Charter of a fleet of reefers jointly by fishing vessel-operating firms in order to bring to Japan such unsuitable species for export as bluefin as well as large yellowfin.

(2) Suspend departure of any new boat to the Atlantic Ocean for a specified time in order to prevent an increase of supplies.

(3) Build cold-storage warehouses in Atlantic ports which may be used freely by the Japanese, and establish an integrated joint selling, transportation, and accounting plan of the catch of Japanese fishing vessels operating in the Atlantic.

In the meantime, the authorities are informally requesting the industry to formulate a list of conference prices for Atlantic tuna at the same level as the prices for frozen yellowfin shipped to the United States from Japanese ports. (Various Japanese newspapers, August 29, September 7 and 8, 1960.)

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RESEARCH VESSEL TO EXPLORE FOR TUNA OFF WEST AFRICA:

The Japanese Fisheries Agency research vessel Shoyo Maru (603 tons) left on Septem-

ber 3, 1960, on a 6-months cruise off the west coast (10° N. lat.-10° S. lat.) of Africa in the Atlantic to locate good tuna fishing grounds and make various scientific studies including the evidence of "green meat tuna." The area is considered a potentially good one for Japanese fishermen.

Japan's tuna fishing vessels in the Atlantic, mostly fishing in waters off Latin America, number about 60. They produce annually about 50,000 metric tons of fishery products valued at about US\$10 million in foreign currency.

While the Western Atlantic has been studied to some extent, very little is known of the fishery resources off the west African coast.

The Japanese research vessel carries a team of 47 fishery experts aboard. Experimental long-line fishing will be carried out in two areas: (1) 10° S. latitude-10° N. latitude and (2) 5° E. longitude-west of 20° W. longitude. The vessel will return to Tokyo in February 1961 after visiting various European fishery bases, including Las Palmas (Canary Islands), Venice, Italy, and a port in Yugoslavia. Also the vessel plans to study the tuna market situation in southern Europe.

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TUNA FISHING IN THE PACIFIC:

Kanagawa Prefecture Fisheries Experimental Station in August 1960 released the following forecasts on Pacific tuna fishing for September 1960 (tonnage indicates catch per 1,300 hooks):

West Pacific, the first fishing ground (north of 20° N. latitude, west of 180°): Big-eyed fishing will continue to be good in waters 30° N. latitude, 150°-180° E. longitude and around the Bonin Islands, yellowfin fishing is also good at rate of 0.5 ton. Also, from Okinadaitojima to 35°-43° N. latitude, 145°-170° E. longitude, catch of striped marlin which has been low for the past few years, is expected to continue at 0.3 ton. Broadbill swordfish will appear around 40° N. latitude, 150°-180° E. longitude and have a good fishing period at 0.6 ton. And schools east of the Izu Seven Islands will yield good catches at 0.4 ton.

West Pacific, the second fishing ground (5°-20° N. latitude, west of 170° E. longitude): In the sea area between the Palau Islands and Truk Island, yellowfin catch will noticeably decrease, compared with August, at 0.5 ton. A good fishing period for big-eyed tuna, an increase over August, at one ton.

West Pacific, third fishing ground (5° N. latitude-10° S. latitude, west of 170° E. longitude): Like August, yellowfin catch will be generally low. In the belt, 5° N. latitude-10° S. latitude, it is on the increase, heading for the good fishing period in the fall at 1.5 tons. In both east and west sea areas of the Solomon Islands, catch will be somewhat lower, at 1.3 tons, than north of 5° S. latitude.

West Pacific, fourth fishing ground (10°-30° S. latitude, west of 170° E. longitude): Being in a poor fishing period, yellowfin catch is low but along the Australian coast it is comparatively high, especially off Brisbane at 2.3 tons. Albacore catches, which were good in August, will be lighter

Japan (Contd.):

and the fishing area smaller. Rates of catch will be 0.9 ton along 24° S. latitude and 1.1 tons along 27° S. latitude.

Central Pacific, first fishing grounds (north of 20° N. latitude, 180°-150° W. longitude): Big-eyed tuna fishing will be steadily improving with good fishing 28°-32° N. latitude. Furthermore, this year happens to be a bumper year and catch rate will be 1.5 tons. Striped marlin season will be good at 0.2 ton.

Central Pacific, second fishing ground (5°-20° N. latitude, 170° E. longitude-150° W. longitude): Both yellowfin and big-eyed tuna will be poor in the sea area, 5°-13° N. latitude at 0.3 ton for yellowfin and one ton for big-eyed tuna. A good fishing period for black marlin is expected in the west of Palmyra Island at 0.4 ton and 0.5 ton on the east side.

Central Pacific, third fishing ground (5° N. latitude-10° S. latitude, 170° E. longitude-150° W. longitude): Although yellowfin fishing was good in August in the entire area, it is beginning to be on the decrease in September around the Phoenix Islands, east and south of the Gilbert Islands. It will be in a poor season south of the Gilbert Islands and around the Phoenix Islands at 1.1 tons for the former and 1.5 tons around the latter; at 1.9 tons north of the equator, north of the Phoenix Islands; 2.5 tons east of Christmas Island and 2.4 tons south. In the western part, 0.6 ton for big-eyed tuna and in the eastern part 0.5 ton. Black marlin catch rate will be 0.2 ton incidental to catching of other fish.

Central Pacific, fourth fishing ground (10°-30° S. latitude, 170° E. longitude-150° W. longitude): Continued good fishing for albacore will prevail between 22°-30° S. latitude at 1.5 tons. South of the Ellis Islands, it is expected to be 0.6 ton.

Central Pacific, fifth fishing ground (south of 30° S. latitude, 170° E. longitude-150° W. longitude): Tuna fishing off Australia north of New Zealand will be somewhat poorer than August at 4.2 tons. In waters 300 miles west of New Zealand and 180 miles northwest of the north cape of New Zealand, a catch rate of some five tons may be expected.

East Pacific, the first fishing ground (north of 20° N. latitude, east of 150° W. longitude): In the area 28°-32° N. latitude, 140°-150° E. longitude, big-eyed tuna fishing will begin to improve, approaching its winter good fishing season at 1.5 tons. Striped marlin will be in its good fishing period at 0.2 ton.

East Pacific, the second and third fishing grounds (20° N. latitude-10° S. latitude, east of 150° W. longitude): Of the area around 120°-150° E. longitude, the belt between 3°-10° N. latitude will yield poor yellowfin fishing at 0.9 ton. Big-eyed tuna will have its good season but conditions are somewhat different in the north and the south of 5° N. latitude at 5.1 tons for the north and 4.4 tons for waters between 3°-5° N. latitude or maybe less. In the area south of the equator, yellowfin fishing in two areas, the equator-2° S. latitude and 5°-10° S. latitude, will have either a good fishing period or will steadily improve at 3.8 tons for the equator-2° S. latitude and 1.8 tons for the area between 5° and 7° S. latitude. Also, 2.7 tons will be the catch rate for 7°-10° S. latitude and in the area, the equator-10° S. latitude, they are expected to be caught with big-eyed tuna whose catch rate is thought to be 3-4 tons.

East Pacific, fourth fishing ground (10°-30° S. latitude, east of 150° W. longitude): Albacore catch around 22° S. latitude will be low at 0.3-0.9 ton but like the fourth fishing ground in the Central Pacific, catch is expected to be higher in the south.

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TWO TUNA MOTHERSHIPS RETURN FROM FIJI ISLANDS AREA:

The Nojima Maru (8,503 tons), one of the tuna-fishing motherships operating in the

Fiji Islands area, returned to its Japanese base on September 8.

This mothership and its fleet of vessels started fishing late in May and attained its catch quota of 5,466 metric tons 15 days earlier than expected due to unexpectedly good catches of yellowfin tuna. She returned to Japan with about 3,500 tons of the total catch, the balance having been shipped to Japan via carrier vessel. Included in the catch by the Nojima Maru's fleet were 1,400 tons of albacore and 1,285 tons of yellowfin tuna. The yellowfin tuna averaged close to 49 pounds per fish as compared with an average of 38 pounds per fish last year. One-third of the entire catch is to be exported.

A second tuna-fishing mothership, the No. 3 Tenyo Maru, arrived back in Tokyo on September 15 from a trip to the same Pacific area. Her fleet's catch amounted to 6,426 tons, including 2,395 tons of albacore and 2,364 tons of yellowfin tuna. The No. 3 Tenyo Maru was replaced on the Fiji Islands fishing grounds with the Koyo Maru on August 3.

Unusually good fishing was reported around mid-August 1960 by these Japanese mothership-type tuna long-line fleets fishing off the Fiji Islands in the South Pacific this season.

The Koyo Maru expected to operate until mid-November 1960, and produce 2,200 metric tons of frozen whole tuna and 2,400 tons of fillets, of which 1,700 tons was to be exported to the United States. (Fisheries Economic News, August 20; other Japanese newspapers of September 13-15, 1960.)

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SEPTEMBER FORECAST ISSUED FOR TUNA FISHING IN INDIAN OCEAN:

The Kanagawa Prefecture Fisheries Experimental Station early in August released forecasts on Indian Ocean tuna fishing in September 1960 as follows (tonnage indicates catch per 1,800 hooks):

Eastern Indian Ocean (east of 100° E. longitude): Yellowfin fishing in the Banda and Flores Seas will be poor with 0.3 ton. In adjacent waters of the Small Sunda Islands and around northwest shores of Australia, fishing will remain at 1.2 tons in the former and 1.5 tons in the latter. Big-eyed tuna fishing is expected to be good in the north of 23°

Japan (Contd.):

S. latitude at 2 tons. Good albacore fishing period is expected west of 110° E. longitude between 20°-30° S. latitude and 10°-13° S. latitude with increased catches of 1.3 tons over August. Indian Ocean tuna will appear from Timor Island to 20° S. latitude, 105° E. longitude and catch will increase suddenly to 2.2-3 tons.

North Indian Ocean (north of 5° N. latitude): Poor fishing for yellowfin and big-eyed tuna in the Bay of Bengal with 0.7 ton for yellowfin and 0.5 tons for big-eyed tuna. Also, poor yellowfin season is expected in the Arabian Sea with 0.7 tons, but big-eyed tuna fishing will be good with 3.6 tons perhaps.

Central Indian Ocean (5° N. latitude-10° S. latitude, west of 100° E. longitude): Yellowfin fishing will be generally poor with 1.6 tons in the eastern region and 2.7 tons in the western part. Big-eyed tuna are expected to be caught in the entire sea area mixed with other species at rate of 1.5 tons.

South Indian Ocean (south of 10° S. latitude, west of 100° E. longitude): Albacore season will be good in the sea area between 22°-30° S. latitude in the east of 52° E. longitude with 1.5 tons in the eastern area and 2.4 tons in the western part. Also, yellowfin will be mixed with other species in that area at rate of 0.8 ton.

* * * * *

TUNA FISHING IN INDIAN OCEAN:

Tokai University's Fisheries Research Institute reported as of mid-August 1960 on fishing conditions in the Indian Ocean as follows:

Generally speaking, fishing in the middle and western Indian Ocean was somewhat inactive and there were only 26 vessels operating. Yellowfin fishing in Sumatra waters was showing a tendency to decline. Comparatively good fishing, however, was reported around 4°-5° S. latitude, 95°-98° E. longitude. Yellowfin and big-eyed tuna fishing was being started on the south side of the Sunda Islands. Albacore fishing continued good east of Madagascar, averaging 3.8 metric tons a day.

Principal fishing grounds for yellowfin, big-eyed, and albacore around Sumatra were

shifting east southeastward. Fishing was good around 95°-98° E. longitude, 4°-5° S. latitude. The fishing ground around Madagascar at 50°-54° E. longitude, 26°-28° S. latitude shifted westward, and although catch decreased somewhat, fishing was rather stabilized. About 12 vessels were still operating in the area. The size of the albacore was about 40-51 pounds each, smaller than those caught farther south. (Fisheries Economic News, August 26, 1960.)

* * * * *

CANNED SALMON SALES AND MARKET PROSPECTS THIS YEAR:

The Japanese Canned Salmon Joint Sales Company towards the latter part of August prepared to sell this year's pack of canned salmon for export. The amount available for export is expected to be about 40 percent less than last year. A 5 to 8 percent increase in price is expected to follow and the sales company expected a meeting of its directors to set the new prices for this season's pack.

The sales company would like to raise the price for export by 10 percent (the same as for domestic sales). But reports state that in Britain, canned salmon stocks are in excess of demand and export sales to that country are not expected to be handled as readily as domestic sales in Japan.

Pack receipts for sale by the sales company for 1960 are estimated to be some 1,300,000 cases (half-pound cans, 96 cans to a case)--a decrease of about 1,000,000 cases from last year's receipts.

Japanese Canned Salmon Joint Sales Company Sales, Fiscal Year April 1959-March 1960				
Product	Carried Over from Previous Fiscal Year	Consigned to Sales Company During Year	Contracted	Remainder
. (Cases of 48 Half-Pound Cans)				
Red	4,350	584,900	589,250	0
Silver	3,000	115,590	118,590	0
Pink	108,550	1,388,000	1,420,850	75,700
Chum	18,450	156,450	174,900	0
Tidbits	2,400	69,950	66,550	5,800
Total	136,750	2,314,890	2,370,140	81,500

The sales company has compiled data on its sales in the fiscal year April 1959-March 1960 (see table). Of the 75,700 cases of pinks not contracted for as of March 31, 1,000 cases are fancy (96 cans of No. 2's); 38,000 cases are standard grade (96 cans of No. 2), 600 cases of 48 cans of No. 4's; 38,500 cases of 96 cans of No. 3 standard;

Japan (Contd.):

and 17,00 cases (96 cans of No. 3) in tomato sauce. (The Hokkai Suisan, May 23, 1960; Fisheries Economic News, August 23, 1960.)

Note: Can sizes are somewhat different from United States usage--No. 2 cans are half-pound cans and No. 4 cans are 1-lb. cans.

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CANNED SALMON EXPORT PRICES:

The Japanese Canned Salmon Sales Company announced early in September, this year's export prices for a case of 96 No. 2 cans of canned salmon--\$1.30 a case higher

Japanese Canned Salmon Export Prices (f.o.b.), 1960			
Type	Cans/Case	For United States, Canada, Europe	
		New Price	Old Price
.....(US\$/Case).....			
Red, #2 can	96	42.10	40.80
Red, #3 can	96	28.15	27.05
Silver, #2 can	96	32.70	31.40
Silver, #3 can	96	21.10	20.70
Pink, #2 can	96	20.80	19.50
Pink, #3 can	48	10.50	10.00
Pink, #4 can	48	18.00	17.00
Chum, #2 can	96	18.30	17.30
Chum, #3 can	96	11.50	11.00
Chum, #4 can	48	16.50	16.00

Note: Can numbers are not the same as used in United States.
No information of equivalent U. S. number of net contents for each can size.

for red and silver salmon and \$1.00 higher on pink and chum salmon. (Suisan Tsushin, September 13, 1960.)

* * * * *

SALMON MOTHERSHIP FLEETS TO FISH BOTTOMFISH IN BERING SEA:

Japanese companies are planning to send six of the salmon mothership fleets to the Bering Sea and North Pacific to fish for flatfish and bottomfish now that the salmon fishing season is ended.

To the Bering Sea: Ekjin Maru mothership with 12 trawlers for a production target of 4,720 metric tons; Miyajima Maru with 6 trawlers, target 5,600 tons; Kyokuzan Maru with 8 trawlers, production target 4,800 tons.

Sea areas west of Kamchatka Peninsula; Kashima Maru mothership with 10 catchers, target 6,500 tons; Chiyo Maru, target 5,900 tons; Ohtsu Maru, production goal of 5,000 tons.

The total production of the 6 fleets will amount to 32,520 tons. Adding frozen prod-



Japanese trawler Kimyo Maru with deckload of flatfish caught in July 1960 in North Pacific.

ucts produced by four other trawling factories operating in the North Pacific, total production is expected to exceed 40,000 tons this year. (Suisan Tsushin, August 23, 1960.)

* * * * *

AQUICULTURAL PRODUCTION UP FOR 1959/60 FISCAL YEAR:

On July 25, 1960, the Japanese Statistics and Survey Section of the Ministry of Agriculture and Forestry published data on cultured pearl, laver, oyster, and other aquaculture production for the Japanese fiscal year April 1959-March 1960. There was a production of 54 metric tons of pearls, 24,000 tons of oysters (meats), and 2,290 million sheets of dried laver or seaweed--increases of 11 percent, 22 percent, and 9 percent, respectively, over the preceding fiscal year. These figures, which are the highest in history, show how aquaculture is taking the spotlight in the Japanese coastal fisheries.

Cultured Pearls: There were 5,548 producers of cultured pearls, an increase of 9 percent over the previous year. The number of enterprises raising oysters for pearl culture increased, but there was a declining trend in the number engaged both in raising the host oysters and culturing pearls. There was a decrease in the number of small operators with from one to 14 rafts, but increases among medium-size enterprises with 15 or more rafts, and large operators with 100 or more rafts. This tendency appeared strong in Mie, Kochi, and Nagasaki prefectures. The total quantity of pearls landed was 53.6 metric tons. Production of small pearls de-

Japan (Contd.):

clined while that of medium and large pearls rose (46 percent of the production was small pearls, 41 percent medium, and 13 percent large).

Oysters: There were 8,009 producers of oysters, a drop of 469 from the preceding year. This drop was due to producers in Iwate and Miyagi prefectures switching to laver growing. Production of shucked meats was 24,000 metric tons, an increase of 4,000 tons. Production has been rising smoothly for the past 5 years. There were increases in all of the principal producing prefectures of Iwate, Miyagi, Saga, and Hiroshima, with a particularly large increase in Hiroshima.

Laver: There were 63,700 producers of laver, an increase of about 2,000 over the preceding year. Production was 2,290 million sheets of the dried seaweed, an increase of about 10 percent. Production dropped about 30 percent in the Northeast and in Tokyo Bay, and increased at about the same rate in Ise and Mikawa Bays. The Ariake Sea had an increase of 114 percent. Production increases by types were 4.7 percent for purple laver, 11 percent for mixed, and 35 percent for green laver.

Prices: Compared with the preceding fiscal year, pearl prices were up over-all by 19 percent. Purple laver prices were up 12 percent and green laver prices were up by 35 percent, but the prices of mixed laver were down by 15 percent. (The Suisan Keizai, July 26, 1960.)

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ECONOMIC TRENDS IN THE FISHERIES, 1959:

The Economic Base in 1959: In 1959, the Japanese economy recovered from the stagnation of the preceding year and showed a growth rate for which there are few precedents in the world, producing the so-called "Sun Goddess Boom." The step-up in productive activity brought an increase in investments and in employment; an improvement in the conditions of employment; an increase in the earnings of workers. Earnings rose to a high level both in the cities and in the farming communities. There was also an increase in consumer expenditures. In fishery activities, too, investment flourished, and the expansion of production

reached a new high. Processing activities to meet the new demand for fishery products because of changes in the nation's food habits were further expanded by the large fishing companies, and production and consumption of fishery products were generally active.



Fig. 1 - Japanese fish-meal factoryship Renshin Maru operating in Bering Sea, July 1960. Uses bottomfish caught by its fleet of 27 trawlers.

Fishery Production: No basic solution was found to conditions on international fishing grounds, but basic fishery production in 1959 was 5.88 million metric tons, the highest in history and 7 percent above the previous year. This was due to increases in the catches of such important species of the offshore and high-seas fisheries as mackerel scad, mackerel, squid, saury, and tunas.

Investment Trends: The increase in production was assisted by fishing conditions and other favorable natural factors, but there was much help from the rapid modernization in recent years of the means of production and unceasing technical improvement. Investment in such sectors continued active during the year. In particular, in the case of fishing vessels over 15 meters (49 feet) in length, replacement with steel vessels, building of larger vessels, and installation of better equipment brought a further improvement in general quality. In smaller boats also, there was an advance in investment connected with installation of motor power, conversion to Diesel engines, etc., and the same was true for technical developments in the field of aquiculture. The large fishing companies continued to diversify their investments by strengthening their activities ashore.

Fisheries Financing: With the general improvement in economic conditions, there was a gradual relaxation of the tight money situation which prevailed the preceding year, and on the whole there was an increase in loans by financing agencies in response to

Japan (Contd.):

the increased demand for capital. In the fishing industry, new loans for facilities were 14 percent above the preceding year. The amount of increase of loans of short-term operating capital showed a tendency to decline as compared with the preceding year, but it can probably be said that there were no signs of a shortage of money. There was a particularly outstanding increase in the securing of capital by the big fishing companies through the issuance of industrial bonds.

Exports of Fishery Products: Supported by world economic recovery, Japan's international trade in 1959 showed a marked expansion. The rate of increase of Japan's export trade in fishery products, which had been 33 percent in 1958, dropped sharply to only 5.4 percent. This was due to a decline in canned products, which had shown a marked increase in 1958. Products of fishing countries other than Japan moved strongly into the world market in 1959.

Economic Trends: In 1959 fisheries production increased, and prices, reflecting de-



Fig. 2 - Japanese crab factory vessel Shimyo Maru operating in the North Pacific. Processes mostly frozen crab and fish.

Domestic Demand for Fishery Products: Prosperity and the bumper rice crop were reflected in an increase in earnings, which brought improvements in the living standard of the people. Along with this came advances in the modernization and rationalization of the people's food habits. Demand for fishery products tended to move in the direction of fresh fish, processed fish of good quality, high-class items, and products easy to prepare for the table. But from the point of view of family income and expenditures, there was a tendency toward a stagnation of growth in both the amount of expenditure for fishery products and in the quantity of such products consumed (or purchased).

Movements of Fish Prices: Although production in 1958 was up by 2 percent over the preceding year, the over-all average price in the producing areas fell by 9 percent. In 1959, although production rose by 7 percent, the decline in prices was only 2 percent, so it can be said that they held fairly steady. Wholesale prices (Tokyo) rose on the average by 3 percent, and prices to the consumer in cities and rural communities were above those of 1958.

mand, were fairly firm. Materials used by the fishing industry showed almost no increases in price, except for some rise in the price of fuel oil, and the supply of those materials was smooth, so that in general the conditions of operation in the fishing industry were favorable. However, this conclusion cannot be equally applied to an industry which includes various segments. In the coastal fisheries, some segments of aquaculture showed a tendency toward stability in 1959, and fishermen using small vessels increased their over-all income, if income from activities other than fishing is added. The income of medium and small fishery enterprises operating offshore and in distant waters tended to increase with the increase in production, but from the increased rate of seasonal participation in diversified fishing activity, it can probably be said that this segment experienced an intensification of competition in production. The large fishing companies strengthened their operating bases through diversification and had good earning prospects. (Japanese Fisheries Agency Weekly Report, vol. 11, no. 22, July 13, 1960.)

Japan (Contd.):

OFFERS OF CANNED SARDINES
SUSPENDED DUE TO SHORT PACK:

The Japanese Canned Fish and Shellfish Sales Company notified the exporters towards the latter part of August 1960 that it suspended sales of canned sardines because stocks were exhausted. The pack of canned sardines had been light—only 372,000 cases had been received from the packers and stocks on hand had been reduced to almost zero. No hope was held out for improved sardine fishing in the Sanin area during August, but an improvement was expected in mid-September. The sardines received were sold to the Philippines and African countries. (Suisan Tsushin, August 19, 1960.)

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INTEREST RATE CUT ON FISHING
VESSEL FINANCING:

The Agriculture and Fisheries Public Fund has been asking the Japanese Ministry of Finance for approval of the decrease in interest rates for small vessels as envisaged in its directive for the promotion of modernization in the coastal fisheries. The approval of the Banking Bureau had been secured as of July 1960, and the Accounting Bureau was expected to give its approval.

Involved are loans for 1,898 vessels (totaling 6,760 tons gross) from a budget of 613 million yen (US\$1.7 million) on terms of 6.5 percent interest, with a maximum of 10 years for repayment and 2 years for deferral, with financing of up to 80 percent of the cost of the vessel.

The financing plans are for 1,760 boats of less than 5 tons gross at 100,000 yen (about \$278) per ton for a total of 431 million yen (\$1.2 million); 83 vessels of 5 to 10 gross tons at 150,000 yen (\$477) per ton for a total of 79 million yen (219,000); and 55 vessels of over 10 gross tons at 180,000 yen (\$500) per ton for a total of 130 million yen (\$361,000). In the case of boats under 5 gross tons, emphasis will be on constructing replacements for over-age vessels and improving vessel efficiency. (The Suisan Keizai, July 26, 1960.)

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LAUNCH LARGE STERN-TYPE TRAWLER:

The Amagi Maru (2,250 tons), stern-type trawler of a large Japanese fishing company was turned over to its owner at a shipyard

in Hirboshima. The vessel is 78.1 meters (256.2 feet) long, 13.5 meters (44.3 feet) wide, equipped with a Diesel engine developing 2,400 hp. and has a capacity for 214.5 metric tons of frozen fish, in addition to many improved facilities. The vessel, Japan's largest trawler of this type, was expected to sail in early October for fishing grounds around Australia and New Zealand. (Japanese Newspapers, September 12, 1960.)

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SALMON SHARK RESEARCH FLEET
IN NORTH PACIFIC:

The Japanese salmon shark research fleet consisting of 2 long-line and 4 drift-net vessels operating around the Aleutian Islands in the North Pacific, reported around mid-August that it had captured 833 salmon sharks. Upon examination, 236 sharks, or about 30 percent of the total catch, were found to have eaten salmon. According to a technician of the Hokkaido Fisheries Research Institute, some of the shark had eaten 7 or 8 salmon.

The purpose of the investigation is to acquire data for the Japanese side in negotiations with the Soviet Union for next year's fishery talks. (Fisheries Economic News, August 25, 1960.)

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FROZEN SHRIMP IMPORTED
FROM COMMUNIST CHINA:

A large Japanese fishing company has imported 15 metric tons of frozen taisho shrimp (Penaeus orientalis) from Communist China, and expected to put them on sale at the Tokyo fish market in August 1960. This is the first import of Communist China shrimp this year. On August 8, it was expected that 300 boxes (each containing 25 pounds) would be received at Tokyo from Shimonoseki, and further shipments were expected to follow. The price had not been set, but the importing company's Shimonoseki office was thinking of selling at 700-750 yen per kilogram (88.2 to 94.5 U. S. cents a lb.). It was also reported that dealers in the Tokyo market will be handling frozen shrimp imported from Communist China by two other large Japanese fishing companies. (The Suisan Keizai, July 26, 1960.)

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SOVIET FISHERIES MISSION INSPECTS
FISHERIES FACILITIES:

An eight-member Soviet fishery mission arrived in Japan on September 6, 1960, aboard

Japan (Contd.):

the Soviet ship Yakutia. The mission is visiting Japan in accordance with the terms of the Japan-U.S.S.R. Fisheries Agreement and was scheduled to inspect Japanese fishery facilities in Hokkaido for a period of about one month.

On his arrival, the head of the mission stated to the Japanese press that there was need for both Japan and Russia to take strong measures for controlling salmon fishing operations. In a separate press interview, he added that the Soviet Union had reduced their operations in accordance with the limitations set by the two countries as the result of their annual negotiations. He held out hope to the Japanese that the maximum fishing catch could be raised at a later date if research and investigation work should prove that salmon resources are increasing. He said, however, that in the meantime measures for the conservation of resources and the maintenance of good spawning conditions would have to be strictly observed if salmon fishing over the long run is to be assured. (U.S. Embassy in Tokyo, September 9, 1960.)



Libya

TUNA FISHERY TRENDS,
SECOND QUARTER 1960:

In Tripolitania the tuna-fishing season this year began under very inauspicious circumstances. By mid-April only six companies were able to resume operations. "Technical difficulties" (e.g., labor shortages or financial difficulties) prevented five other companies from operating this season. During the late April-to-early-June period, the companies operated off the western Tripolitania coast. Local sources described the tuna catch as satisfactory. After mid-June the fishing was concentrated off the eastern shores of the Province where the catch was better than average as of the end of July. (United States Embassy, Tripoli, July 30, 1960.)



Mexico

EXPORT DUTIES INCREASED
ON SHRIMP AND CRABS:

Effective August 21, 1960 (Diario Oficial, August 20, 1960) by changes in official prices, upon which ad valorem duties are based, Mexico increased export duties on shrimp and "walking" crabs and reduced export duties on live turtles. On fresh or iced shrimp duty increases amount to about 1.89 U. S. cents a pound for shrimp originating in the Gulf of Mexico and about 1.73 cents a pound for shrimp from the Pacific. Duty increases on frozen shrimp amount to about one-third of a cent a pound on shrimp coming from the Gulf of Mexico and Salina Cruz, Oaxaca, and Santa Rosalia, Baja California, and about three-tenths of a cent a pound on shrimp originating in other regions.

The new export duty rates on fresh or iced shrimp are about 13.439 U. S. cents a pound for shrimp from the Gulf of Mexico and 13.069 cents a pound for those from the Pacific. On frozen shrimp the new duty rates are 2.510 U. S. cents a pound for frozen shrimp from the Gulf of Mexico and Salina Cruz, Oaxaca, and Santa Rosalia, Baja California, and 2.443 cents a pound for frozen shrimp originating elsewhere. Official prices were increased from 1,223 and 1,250 pesos per 100 net kilos to 1,410 and 1,450 pesos, respectively. The higher prices pertain to shrimp originating in the Gulf of Mexico. Duty rates, per 100 net kilos, are 0.30 pesos specific plus 25 percent ad valorem for fresh or iced shrimp and 2.50 pesos specific plus 4.5 percent ad valorem for frozen shrimp. The ad valorem duty is based on the official price. In addition to the export duties there is a 2-percent municipal tax placed on the amount of the export tax.

Most of Mexico's exports are frozen shrimp. According to official statistics, Mexico in 1959 exported only 16,400 pounds of fresh or iced shrimp whereas 65.5 million pounds of frozen shrimp were exported during the same year.

The official price for fresh, iced, or frozen Moro crabs (Menippe mercenaria) and other "walking" crabs was increased from 4.00 pesos to 6.80 pesos a gross kilo. This involves a duty increase from about 1.48 U. S. cents (old rate) to about 2.52 U. S. cents per gross pound. There was no change in duty on swimming crabs. According to official

Mexico (Contd.):

statistics, there were no exports of either Moro or other "walking" crabs during 1959.

The official price on live marine turtles, other than tortoise-shell turtles, was reduced from 2.80 to 2.00 pesos a gross kilo. Export duties, as a consequence, dropped from about 1.04 to about 0.74 U. S. cents a gross pound. Mexican exports of live turtles in 1959 were 167,600 pounds.

It is not expected that the duty changes reported here will have any appreciable effect on Mexican exports of the items mentioned. (United States Embassy, Mexico City, August 23, 1960.)



Morocco

FISH MEAL AND OIL INDUSTRY:

In 1959 Morocco produced 17,714 metric tons of fish meal, 4,694 tons of fish oil, and 115 tons of other fishery byproducts. These products are manufactured primarily

at Agadir and Safi. There seems to be no production of fish meal as fertilizer.

In each port of Morocco, the official CARPI Agency (Comptoir d'Agreage et de Repartition du Poisson Industriel)



takes care of the distribution of landed fish, taking into account the quality and the needs of local consumption and industry. Thus, the price of fish destined for byproducts is fixed. At present, manufacturers consider that the prices

Moroccan Fish Meal and Fish Body Oil Exports, 1958-59

Product and Country of Destination	1959			1958		
	Quantity	Value		Quantity	Value	
	Metric Tons	1,000 Moroccan Francs	US\$	Metric Tons	1,000 Moroccan Francs	US\$
Fish Meal:						
France	8,113	473,679	836,084	12,362	795,537	1,572,140
West Germany	2,942	172,562	341,017	1,913	93,120	184,024
Spain	1,048	56,363	111,385	288	14,172	28,007
Hungary	100	6,206	12,264	-	-	-
Poland	298	17,237	34,064	200	10,263	20,282
Netherlands	272	15,539	30,708	-	-	-
Czechoslovakia	1,011	58,623	115,851	667	40,451	79,939
East Germany	300	18,376	37,303	-	-	-
Yugoslavia	-	-	-	397	24,302	48,026
Brit. Terr. Asia	99	6,455	12,756	-	-	-
United States	200	12,110	23,932	796	47,012	92,905
West Africa	-	30	59	-	-	-
Madagascar	130	9,646	19,062	25	1,641	3,243
Switzerland	2	287	587	-	34	67
Total Meal	14,515	847,613	1,675,052	16,648	1,026,532	2,028,633
Fish Body Oil:						
France	3,085	197,518	390,335	1/	1/	1/
West Germany	463	23,941	47,312	1/	1/	1/
Netherlands	283	15,280	30,157	1/	1/	1/
Norway	100	6,807	13,452	1/	1/	1/
Total Oil	3,931	243,526	481,256	1/	1/	1/

1/Not available.

Note: Values converted at rate of one Moroccan franc equals US\$0.0019762 (506 Moroccan francs equal US\$1.00).

Morocco (Contd.):

paid for raw material are too high, as they do not permit any fair competition on foreign markets.

At Safi, the price of fish (chiefly sardines) destined for byproducts was fixed at 8 francs a kilo (US\$14.60 a short ton), which including taxes, disembarkment, and transportation costs, amounts to 9.97 French francs a kilo (US\$18.00 a ton) of fish brought to the plant.

Manufacturers also use waste fish from canneries or freezing plants. In that case, the price is lower, as it is fixed at the end of the fishing year and usually reaches an average of 7 francs a kilo (US\$12.60 a ton).

Fish meal and oil prices are essentially changeable and depend on the prices offered on foreign markets. Each plant fixes, considering its own cost price, its possibilities of production and exports, according to those foreign prices. Prices were sharply declining the latter part of July 1960 and were:

At Hamburg:

- From Peru: 43 and 40 French francs a kilo (US\$78 and \$72 a short ton) f.o.b. Peruvian port (65 percent protein). These prices are considered by Peruvian exporters as below their cost price.
- From Norway: Herring 79-80 francs a kilo (US\$144-146 a short ton), c.i.f. Marseilles.
- From France: 58 francs a kilo (\$106 a short ton), railway station La Rochelle.

At France:

- From Peru: 58 francs a kilo (US\$106 a short ton), from railway station of Nantes.
- From Morocco: 62 francs a kilo (US\$112 a short ton), from railway station of Nantes.

Moroccan manufacturers consider that the above prices do not cover their present cost prices.

Fish oil is sold at different prices depending on the quality. Prices in July 1960 ranged from 64 francs a kilo (5.8 U. S. cents a pound) for crude fish oils to 99 francs a kilo (9 U. S. cents a pound) for refined, deodorized oils, c.i.f. French ports. (United States Embassy, Rabat, June 27, 1960.)

Note: Unless otherwise indicated, values converted at rate of one French franc equals US\$0.002 (490.60 francs equal US\$1.00).



Netherlands

WHALE-OIL TANKER SOLD TO JAPANESE:

The Netherlands whaling company and a Japanese whaling firm have signed a contract concerning the sale of the Dutch 10,725-ton whale-oil tanker Bloemendael. According to the Netherlands Whaling Company, the contract price was £420,000 (US\$1,176,000) delivered at Yokohama. The contract is subject to approval by the Japanese Government.

The Japanese firm has reportedly purchased the ship in order to prepare for whaling operations in the Central and North Pacific.

The Netherlands Government will benefit from the sale, since the contract between the Government and the Netherlands whaling company stipulates that the Government will receive any amount in excess of the presently determined book value based on allowances for depreciation. The tanker, built in 1931 (at which time it was the William Barendsz), originally was used as a factoryship. (United States Consulate in Amsterdam, August 31, 1960.)



Norway

FROZEN FISH EXPORT TRENDS:

The Norwegian frozen fish organization, whose brand of frozen fish has found wide acceptance in the United States, recently joined forces with an 80-year-old Dutch food packing firm for distribution of Norwegian frozen fish in the Netherlands and other Benelux countries. But Norwegian frozen fishery products have been sold in the Netherlands for some ten years through a subsidiary whose name now will be changed to reflect ownership by the Norwegian organization and the Netherlands firm.

The Norwegian frozen fish organization, whose gross sales in the fiscal year that ended June 30, 1960, rose Kr. 20 million (US\$2.8 million) to reach about Kr. 90 million (\$12.6 million), hopes to export 1,000 metric tons to Great Britain this year. In cooperation with a British refrigerator manufacturer, a nationwide advertising campaign was expected to be launched in October.

Norway's second largest exporter of frozen fish fillets has had a record supply of raw material this year. In the first half of 1960, the firm's plant at Hammerfest, North Norway, received 12,000 tons of fish, as against 7,000 tons in the same period of the preceding year, and a total of 13,000 tons in the entire year of 1959. Meanwhile, plans are proceeding to double the firm's present annual production of 6,000 tons of frozen fillets. (News of Norway, September 8, 1960.)

Norway (Contd.):

NATIONAL FISHERIES FAIR 1960:

The National Fisheries Fair 1960, largest in Norway's history, was held in the west coast port of Bergen, August 25-September 11, under auspices of Norwegian Trade Fairs. The event was opened by King Olav, who also formally dedicated the new 10-story Oceanographic Research Institute. This was built by the Fisheries Directorate at a cost of Kr. 5.5 million (US\$770,000). At the same time, the adjoining Bergen Aquarium was opened for public inspection. Biggest and most modern aquarium in Europe, the Kr. 3.5 million (US\$490,000) structure was financed exclusively by local contributions.

The Fair graphically illustrated the rapid strides made by Norway's fishing industry in recent years. Seafood products, modern fishing gear, motors, vessels, navigational aids, and other electronic instruments, were shown at 218 stands. Among the 200 exhibitors were 40 firms from Great Britain, United States, Denmark, Sweden, France, Germany, and the Netherlands.

In connection with the sales fair, sponsors organized a series of trade meetings. There were separate sections for boat building machinery, boat equipment, technical aids, fishing gear, fish processing, canning, filleting, and freezing, exports and imports, as well as equipment for sports fishing. Other sections were devoted to activities of the Norwegian Sea Rescue Society, insurance, economic conditions of Norway's fishermen and fishing industry, social benefits, the Fishery Bank, and fishery inspection. Research experimentation, and administration of the Fisheries Directorate were also emphasized.

Exposition buildings had a total floor space of some 75,000 square feet. The 14,000 square foot general section offered numerous attractions, including a giant relief map of Norway with magnetized fishing vessels that could be directed to the main coastal fishing grounds. Color movies, showing fishermen in action, were shown several times each day, while experts demonstrated ways of preparing and cooking fish and other sea products.

A major attraction is the Bergen Aquarium. The public part of the aquarium comprises one general and one special section, located on separate levels. The former pre-

sents a vast variety of mixed fish and other sea creatures in nine glass tanks lining a circular room. The 19x22 foot tanks have wide-angle side walls, thus giving the impression of a single, undivided aquarium. The special section, also comprising a series of glass tanks, is designed to demonstrate three themes--the development of species, specialization to meet changing environments, and habits of individual fish species.

Closed to the public is a huge circular tank below the aquarium levels. When finished in another year, this will give researchers an opportunity to study the actions of ocean currents and their effect upon fish behavior. The 10-foot wide tank forms the outer ring of a circular research laboratory, over 50 feet in diameter, with a glass-walled observation room for researchers in the center.

Ten feet deep, the tank is divided into 10 compartments, each separated from the observation room by two windows, and each capable of being closed off from the rest. By varying the density of water fed into the tank, Norwegian scientists will seek to create different layers of current in various compartments. Thus, they hope to throw new light on the interaction of ocean currents and, also, how fish are affected by changes in currents, temperatures, and salinity.

The Bergen Aquarium is connected with the Oceanographic Research Institute, located in a building of striking architecture. The Institute accommodates administration offices as well as a number of specialized research laboratories. The latter cover physical oceanography, various fisheries--such as cod, herring, brisling, sardines, and mackerel--plus plankton. A department for fish physiology and behavior is also projected. (News of Norway, September 1, 1960.)

WEST AFRICAN EXPLORATORY FISHING EXPEDITION PLANNED:

The Norwegian Directorate of Fisheries is actively engaged in assembling a fleet of 10 fishing vessels to accompany the Directorate's research vessel Johan Hjort and the freezer ship Caribia on an exploratory fishing expedition to the West African coast this year. According to Fiskaren (August 3, 1960), a Norwegian fishery trade periodical, 19 fishing craft have expressed a desire to take part in the expedition. However, only 10 vessels

Norway (Contd.):

will be taken and they will be offered a guarantee against loss up to 75,000 Kroner (US\$10,500) per vessel for the months of October, November, and December.

The Directorate of Fisheries is interested in steel vessels with freezing equipment and insulated cold-storage rooms which can hold the catch at 32° F. The vessels must have cod or pollock seines or long lines for tuna. A specific vessel size has not been set, but it is thought that they should be about 100 feet in length.



Pakistan

FISH MEAL AND OIL INDUSTRY:

Pakistan's fish-meal industry is passing through an indeterminate stage due to the rapid decline in world prices and a lack of suitable stocks of fresh and dried fish.

Fish-meal production in 1959 was estimated at 3,000 long tons. Fish oil is produced on a very small scale by cottage industries; production figures are not available. No fish oil was exported from Pakistan in 1959.

Pakistan's fish-meal industry consists of approximately six commercial plants concentrated on the outskirts of Karachi. Of these, only two are modern reduction plants; the others employ the grinding process with sun-dried fish as the raw material. Total estimated capacity is approximately 130 tons per day. The Government of Pakistan plans to approve the establishment of a fish-meal plant in East Pakistan and a large plant in West Pakistan at Gwadur. The West Pakistan plant will have a 75-ton-per-day reduction capacity and will also have fish-oil extraction facilities; it is expected that the plant will be in operation by April 1961.

It is estimated that the cost of production of fish meal in Pakistan is between Rs. 430 and Rs. 480 (US\$91 to \$102) per long ton for those factories which have their own fishing trawlers. Sardines used for reduction purposes cost from Rs. 120 to Rs. 140 (US\$25 to \$30) per ton, while fish heads, fish waste, and sharks cost Rs. 60 (US\$13) per ton. Fresh fish used in the two modern fish-meal plants is not available on a continuing basis.

Present fish-meal prices of approximately 28 pounds sterling (US\$79) 1/a long ton, cost and freight Continental port, bring in no buyers, but prices lower than \$25 (US\$70) bring in some buyers, mainly from Germany, Holland, and Ceylon. In 1959, Pakistan's highest export price to West Germany was \$47 (US\$132) a ton.

There are no Government aids or special taxes for the benefit of Pakistan's fish-meal and oil industry. But under the Export Bonus Scheme which came into operation in January 1959, Pakistan's exporters of

certain commodities, including fish meal, can utilize a stated percentage of their foreign exchange earnings for the importation of some 219 commodities. Exporters of fish meal and oil are entitled to bonus vouchers up to 20 percent of the foreign exchange earnings. The Government of Pakistan has recently informed fish-meal exporters that the bonus entitlement has been raised from 20 to 40 percent. These bonus vouchers can be sold openly and at present are worth a premium of Rs. 120 (US\$25) for the face value of Rs. 100 (US\$21). The prospect of earning this premium enables the Pakistani exporter to reduce his export prices.

Table 1 - Pakistan's Fish Meal Exports, 1959

Country of Destination	Quantity	Value	
		Long Tons	Rupees US\$
West Germany	1,524	661,211	139,846
Netherlands	120	39,503	8,355
United Kingdom . . .	55	20,140	4,260
Ceylon	75	25,575	5,409
Total	1,774	746,429	157,870

Note: Values converted at rate of one rupee equals US\$0.2115 (4.728 rupees equal US\$1).

Peru's entry into the export market for fish meal (67 percent versus 47 percent for Pakistan) and an average export price of \$28 (US\$79) per metric ton, has adversely affected Pakistan's export trade. The demand for Pakistan's fish meal is now very slow. This, in turn, has resulted in lower production, now reported to be about 5-7 tons per day. One plant owner has sold out because the fish-meal business is now non-profitable. (United States Embassy, Karachi, August 19, 1960.)

1/Values converted at rate of one pound sterling equals US\$2.8094.



Panama

SHRIMP INDUSTRY STUDIED BY FAO EXPERT:

The Panamanian Government will receive preliminary recommendations from the Food and Agriculture Organization (FAO) to counteract a decline in its shrimp fishery. An expert from the Government Institute for Fisheries Research, Ymuiden, the Netherlands, under FAO auspices and at the request of the Panamanian Government, has been interpreting data on Panama's shrimp industry collected since 1954, when a previous FAO fishery expert set up a research laboratory in Panama City. The expert completed the study in mid-1960.

The profits from shrimp fishing, which had in the beginning been good, had started to decline, so that in recent years the industry had economic difficulties. Analysis of the fishing intensity and shrimp resources has indicated that changes in the catches are due partly to

Panama (Contd.):

intensive fishing. Some Panamanian ships have already been forced to turn to shrimp fishing off other Latin American countries, the FAO expert's report points out. They often return to Panama to land the shrimp for processing, if the distance is not too great.

In 1958, the shrimp fleet numbered just over 200 vessels. In June 1960 there were 160 vessels left in the fleet, with 15 more vessels planning to leave the fleet to fish shrimp elsewhere than off Panama.

Shrimp forms 25 percent of Panama's exports, and is second in importance only to bananas as an export product. Apart from a small amount of shrimp used for home consumption, the country annually catches and exports 8 million pounds of shrimp, valued at \$6 million. Nearly all of the exported shrimp goes to the United States.



Peru

FISHERIES TRENDS,
SECOND QUARTER 1960:

During the second quarter of 1960, the important fish-meal industry of Peru was confronted with a deepening crisis, brought on by overproduction, reduced world demand, and low prices. Attempts of the industry to find a way of limiting production through self-imposed quotas have been without success. It is generally believed that such attempts will not be successful, but that natural economic factors will eventually work to bring stability to the industry.

Exports of fish meal were maintained at an unusually high rate for the first five months of the year, with a monthly average of about 51,000 metric tons (data based on shipping documents). An extended tie-up of anchovy fishermen in April and May, poor fishing in the Callao area, and seasonally reduced fishing in the third quarter will probably result in a reduced rate of production during the remainder of the year. Members of the trade consider that a realistic production figure for 1960 would be about 500,000 tons.

Exports of fishery products for the first 3 months of 1960 increased by 157 percent as compared with the same period of 1959, but the increase in f.o.b. value was only 97 percent. Fish meal exports increased 190 percent in quantity and 130 percent in value. Other fishery products exports, which were larger in the first quarter of 1960 than in 1959, included frozen skipjack tuna and shrimp, canned bonito, fish oil, and whale oil. Since fish meal exports constitute between 85 and 90 percent of total fisheries industry exports by quantity (between 70 and 80 percent by value), there can be no doubt of the importance to the fisheries in-

Peru's Principal Fishery Products Exports, First Quarter 1958-1960

Products	Quantity			F.o.b Value					
	1960	1959	1958	1960		1959		1958	
	..... (Metric Tons)			Soles 1 Million	US\$ 1,000	Soles 1 Million	US\$ 1,000	Soles 1 Million	US\$ 1,000
Frozen fish:									
Skipjack tuna	1,650	930	640	4.7	170	2.9	110	1.5	71
Other tuna	2,396	2,976	1,401	7.0	253	9.0	341	3.3	155
Swordfish	4	32	7	0.05	2	0.4	15	0.1	5
Shrimp ("Langostinos")	40	13	71	1.0	36	0.3	11	1.3	61
Total frozen fish	4,090	3,951	2,119	12.7	461	12.6	477	6.2	292
Canned fish:									
Bonito	4,166	3,540	2,884	40.8	1,473	34.7	1,314	22.1	1,040
Tuna	110	241	277	1.0	36	2.1	80	1.6	75
Total canned fish	4,276	3,781	3,161	41.8	1,509	36.8	1,394	23.7	1,115
Fish byproducts:									
Fish meal	148,091	51,058	24,492	360.2	13,004	156.7	5,936	51.7	2,434
Sperm oil	4,808	3,749	2,790	15.9	574	12.7	481	9.2	433
Fish oil	4,903	1,301	927	13.7	495	3.4	129	2.4	113
Whale meal	308	998	400	0.5	18	3.1	117	0.7	33
Total byproducts	158,110	57,106	28,609	390.3	14,091	175.9	6,663	64.0	3,013
Total fishery exports	166,476	64,838	33,889	444.8	16,061	225.3	8,524	93.9	4,420

1/Average rate for U. S. dollar exchange certificates was 27.70 soles in the first quarter of 1960; 26.40 soles in the same period of 1959; and 21.24 soles in the first quarter of 1958.

Peru (Contd.)

dustry and to the economy of Peru as a whole of an early solution to the present problems of the fish-meal producing industry.

Cost of production is an important factor in the ability of Peru's fish meal producers to withstand the current difficult period. When prices began to fall from a high of about US\$140 per ton in 1958 to \$90 at the close of 1959, production costs were stated to be about \$90. As prices have come down, production cost estimates have been lowered. It has been authoritatively stated that \$58-63 is the absolute minimum at which a ton of fish meal can be produced in an efficient plant. One of the largest producers is reported to have said recently that his costs are considerably less than that, and that he expects to reduce them even further with the installation of new equipment. Doubt has been expressed by other producers that a lower cost figure than about \$58 per ton is possible. Another producer, without mentioning actual costs, insisted that reducing them represents the principal way in which Peruvian producers can weather their present difficulties and continue to produce and sell fish meal in the world market. A number of plants have closed because prices are below costs and it is believed that other plants will follow. Some may not be able to reopen.

The average price for fish meal (65-percent protein) f.o.b. Peruvian ports for the April-June 1960 quarter was US\$73.33 (\$80.00 in April, \$75.00 in May, and \$65.00 in June). During the same period of 1959, fish meal prices averaged \$128.33 f.o.b. Peruvian ports (\$135.00 in April, \$130.00 in May, and \$120.00 in June 1959).

The construction of boats primarily for anchovy fishing continues at a rate somewhat below that of 1959 in the shipyards of Callao. One of the largest yards built 90 vessels in 1959, for the most part wooden vessels up to 80 tons. Up to mid-June 1960, that yard had built 12 wooden vessels and 22 steel-hulled vessels of 80 to 120 tons. At the end of June, the keel was laid for a 180-ton steel-hulled vessel, the largest fishing boat ever built in Peru. The increasing size of these boats seems to indicate a trend towards the construction of larger vessels to help cut costs for fish meal producers.

The continuing construction of fishing vessels in the face of the closing of fish meal plants and the likelihood that fishing equipment now in use will have to be beached represents a paradox explicable only in the same terms as the overexpansion of the fish meal industry; that is, the accelerated rhythm of too rapid expansion has not yet been halted. Observers believe, however, that there is a definite reduction in the rate of expansion and that it will come to a complete halt in the near future.

The municipalities of the Greater Lima area extended to September 3 the period allowed fish meal plants to eliminate obnoxious odors. (United States Embassy report, Lima, July 15, 1960.)



Philippines

GOVERNMENT MAY REDUCE
25-PERCENT EXCHANGE MARGIN TAX:

The Director General of the Philippine National Bank, member of the Philippines Central Bank Monetary Committee, is reported to have stated that a reduction is being considered in the exchange margin tax

from the present 25 percent rate. He said a strong request had been made by industry to alleviate the Government policy of tightening up exchange control. The reduction will be timed with steps to be taken for the safe and effective use of the foreign exchange held by the Government.

The margin tax has been applied since last year to all Philippine canned foods imports other than canned sardines and salmon. The Japanese report that it has caused canned salmon, cuttlefish or squid, "horse-mackerel," and common mackerel exports to the Philippines to drop. In the case of canned mackerel-pike, a large reduction in price had to be put in effect. In the case of canned cuttlefish, many purchase contracts were cancelled and heavy stocks have built up in Japan. (The Suisan Tsushin, August 20, 1960.)



Portugal

UNITED STATES SHIPMENT OF
LIVE STRIPED BASS RECEIVED:

Fifty striped bass arrived in Lisbon, Portugal, August 25, 1960, by air from Rhode Island, and were taken to a sea-water lagoon for recovery and initial breeding. At a later date, they will be transferred to southern shore waters where it is hoped they will multiply as they did years ago when transplanted from the United States east coast to the west coast. The shipment was the result of cooperation between a well-to-do Portuguese amateur fisherman and the Department of Agriculture and Conservation of Rhode Island. (United States Embassy in Lisbon, September 2, 1960.)

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COD CATCH FROM WESTERN
ATLANTIC BETTER THIS YEAR:

Reports from the Portuguese cod fleet fishing on the Greenland and Newfoundland Banks confirm earlier expectations that fishing is much better than in 1958 and 1959. Some 11 trawlers are reported to have returned to Portugal with full cargoes and gone back to the Banks for a second voyage. Only four trawlers made two trips in 1959, the United States Embassy in Lisbon reported on September 2, 1960.

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Portugal (Contd.):

COMMITTEE ESTABLISHED TO STUDY FISH CANNING AND EXPORTING ASSOCIATIONS:

The Portuguese Secretary of State for Commerce on August 30, 1960, formally installed an 8-man committee of industry and Government representatives to study the regulations and operations of the "Associations" (cooperative-type marketing groups) of manufacturers and exporters of canned fish. The committee's findings, if implemented by the Government, may have much significance for marketing practices in the fish-canning industry. The survey of the industry will not be complete, however, until a committee to consider relations between fishing and fish-selling practices and the industry has also been appointed and completed its study. Appointment of this second committee was expected soon, but several months may well elapse before both have completed their work, the United States Embassy, Lisbon, reported on September 2, 1960.

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SEAWEEDS IN THE CAPE VERDE ISLANDS AREA STUDIED:

The Center for Fisheries Biology maintained by the Overseas Investigation Board of the Ministry of Overseas carried out a study during 1958 of the availability of agar-bearing seaweeds in the Cape Verde Islands area. The results of the study were not encouraging as the quantities found did not justify commercial exploitation or further investigation.

A similar study is being carried out along the shores of continental Portugal.

**Ryukyu Islands**FROZEN TUNA TO BE EXPORTED TO JAPAN:

The Japanese Ministry of International Trade and Industry early in September designated frozen tuna from the Ryukyu Islands as an import item. As a result, Japan will import some 500 metric tons of tuna from Okinawa in compliance with the request of the Ryukyu Government after talks between the two countries. The Japanese feel that the imports will not, in any way, affect

Japan's skipjack tuna fishery since the quantity is but 500 tons a year, but there are hopes of increasing the quantity in the future. (Fisheries Economic News, September 6, 1960.)

**Spain**FISH MEAL AND OIL INDUSTRY AND MARKET:

There are some 60 to 65 producers of fish meal and oil in Spain. The greatest concentration (37) is located in the Canary Islands--the remainder is found along the Spanish coastal region. Of the total approximately 12 are major producers. The capacity of the Spanish industry is not known. Preliminary production data for 1959 show that 17,835 metric tons of fish meal and 1,433 tons of fish oil were produced; however, it has been reported that this estimate is below actual production. It is possible that actual capacity may be 3 or 4 times present production. It is known that fish-meal production has almost tripled since 1955, without any significant addition to plant capacity.

There are no known developments or plans for development of the fish meal and oil industry of Spain. In addition, there are no government programs designed to assist the fish meal or fish oil industry, except for import restrictions. However, manufacturers are eligible for low-interest loans from the Marine Social Institute for building and modernization, although most of the loans granted by that agency are for improvement of the fishing fleet.

The importation of both fish meal and oil is controlled by import license. The amount of fish-meal imports authorized has in recent years been limited to an approximation of the difference between national production and national consumption needs as calculated by the National Fish Syndicate. According to the Syndicate, fish-meal imports may soon be liberalized in spite of the protests of fish-meal producers who claim that imports from Portuguese Angola and Peru will inundate the Spanish market at "dumping prices."

Table 1 - Spanish Imports of Fish Meal and Oil, 1957-60

Product	Jan.-Feb. 1960	1959	1958	1957
	(Metric Tons)			
Fish meal	2,503	2,415	3,987	3,987
Fish oil	188	2,323	3,715	2,584

Current duties on imported fish meal are 5 percent ad valorem and an additional 2 percent "fiscal tariff" levied on the value plus the 5-percent duty. For fish oils, a duty of 1 percent and a "fiscal tariff" of 4 percent are imposed on crude oils, and a duty of 6 percent and a "fiscal tariff" of 4 percent on refined oils. Duties are imposed on the c.i.f. value of the merchandise.

The price of fish oil imported into Spain varies between 5 and 6 pesetas per kilo (4 and 5 U.S. cents per pound) 1.

In the case of fish meal, free imports would probably result in increased consumption of fish meal for animal feeds, and a diminished share of the domestic market for Spanish producers. At the present time, high-grade Spanish fish meal sells for 14 pesetas per kilo (US\$211 per short ton), compared with a price of 9 pesetas (US\$136) for imports from Angola and Peru. Until now, this price difference has not harmed Spanish producers since imports have been limited to covering the gap between estimated consumption needs and domestic production. It is unlikely that Spanish producers will be able to cut their prices to compete with low-priced imports because of the

Spain (Contd.)

relative scarcity and the high price of the fish used in production. (United States Consulate dispatch from Vigo, August 15, 1960.)
 1/Values converted at the rate of one peseta equals US\$0.0166 (60 pesetas equal US\$1.00).



Sweden

EFFECT OF EUROPEAN TRADE PACTS ON FISH-CANNING INDUSTRY:

In discussing the effect of the European Free Trade Association (EFTA) and the European Common Market on the sale of canned fish products, the Director of A/B Sveriges Forenade Konservfabrikker (The Swedish United Canning Factories), Goteborg, said in a press interview in August that the markets represented by the 13 countries included in the two pacts take only a relatively small part of the pack of the canneries involved and such sales as are made are about equally divided between the two groups.

Only about 15 percent of the annual output of the factories goes into export, principally to the United States and Canada. East Germany is also a large purchaser, especially of Swedish sardines.

The company's main market is the domestic market and the effect of the EFTA agreement will first be noticeable in the home market because canned fish products are protected by relatively high Swedish customs duties. No immediate problem, however, is expected to arise out of EFTA because the tariff reductions that have up to now been made under the agreement are relatively small. But even when the Swedish tariff rates are considerably reduced and eventually disappear, the possibilities will be good for the sale of the Swedish fish-canning industry's products in the domestic market. Through the refund to canneries of the regulating fees which are now levied on certain agricultural products, it is expected that the Swedish fish-canning industry will be placed on more equal terms with foreign producers.

In regard to the European Common Market, the Swedish canners count on maintaining the present export of traditional Swedish specialties if the tariff hindrance is not too great.

Within the European Free Trade Association, a greater export sale is expected with the lowering of the customs duties.

The certificate of origin procedure presents no problems to the fish-canning industry because the greater part of the raw material is considered domestic. Such import as does take place, for example Icelandic herring, can be easily documented.

In closing, the Director stressed that it must be remembered that the situation in the European market is very unclear and that it is not known what the future development will be in the politico-commercial field. For this reason, he said, it is difficult to judge what consequences can arise out of the division of the European market. (United States Embassy, Goteborg, August 22, 1960.)



Trinidad

SHRIMP FISHERY EXPANDS WITH VESSELS FROM UNITED STATES:

Using Port-of-Spain, Trinidad, as a base, a United States company has transferred 10 of its shrimp trawlers there to exploit the shrimp grounds off the Guianas. The company is registered in Trinidad and has leased space in a local cold-storage plant to set up shrimp processing and freezing facilities. The shrimp trawlers will obtain their fuel oil, ice, and stores in Port-of-Spain, and thus bring considerable business to the city, in addition to employing some 30 people at the processing plant. All of the processed packaged shrimp will be exported.

Each trawler is operated by a crew of 3 men and may take on local crew members and train them in shrimp fishing methods. The fleet will stay on the fishing grounds for prolonged periods and transfer catches to two of the trawlers, in rotation, every 6 or 7 days, to bring them to Port-of-Spain. If expectations are fulfilled, the company plans to increase its fleet to 30 boats by the end of 1960. (West Indies Fisheries Bulletin, May/June 1960.)



Tunisia

FISHERY TRENDS, SECOND QUARTER 1960:

Tunisia's tuna and sardine season this year began discouragingly with catches running well below early estimates. Reports from the southern fishing port of Mahdia said that early



A Tunisian fishing vessel hauling in a netload of sardines. A small boat equipped with electric surface lamps stays on the fishing grounds for several hours. Its lights attract the fish. The main fishing boat approaches the concentration of fish and encircles them with a purse seine.

sardine fishing efforts had met with almost total failure. As for tuna, the scarcity of local supplies was emphasized once again by a Japanese vessel discharging a large quantity (150 tons) of tuna at Mahdia where it was to be canned by the local cannery.

Meanwhile the Tunisian Government had not slackened its drive to develop other sectors of the fishing industry. A Yugoslav engineer arrived in Tunis in mid-June 1960 to take up his duties as Director of Tunisia's shipyards. According to announced plans, the National Fishing Office has drawn up a ten-year program calling for the construction in Tunisia of about 100 medium fishing craft.

Pending fishing craft construction in its own shipyards, the Fishing Office has acquired another trawler from abroad for its fishing fleet. The vessel, designed for shrimp fishing, is the third vessel the Fishing Office has purchased this year with a view to increasing the shrimp catch from the waters off southern Tunisia.

Delivery of the first 2 of the 4 United States-financed shrimp trawlers to the National Fishing Office has again been delayed. It was expected that the vessels would be handed over sometime in the fall of 1960. (United States Embassy, Tunis, August 6, 1960.)

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FAO EXPERT HELPS TO DEVELOP FISHERY RESOURCES:

A French FAO fishery expert, while in Tunisia for the past 3½ years, was active in finding new fishing grounds. He charted the area bordering Tunisia and found grounds suitable for trawling shrimp, hake, lobster-like "scampi," and numerous other species of fish, near the Tunisian harbor of Kelibia. The International Cooperation Administration (ICA) is now outfitting the Tunisian Government with four trawlers to exploit these grounds.

The survey of the Tunisian fisheries showed possibilities for improvement in the sardine fisheries and in extending Tunisian trawling farther offshore. Together with an FAO master fisherman from Italy, the French expert introduced the use of an underwater lamp into Tunisian sardine fishing. Tunisians had been using lamps hung over the surface of the sea to attract sardines for purse-seining. However, the FAO expert's experiments showed that light from above the water lamps was mostly reflected upward by the sea surface and that one underwater lamp could do the job of eight of the above-surface lamps. Underwater lamps have now been adopted by most of the Tunisian sardine fishermen, with savings in fuel costs and increased efficiency. He also introduced the use of small Diesel-powered generators to operate the underwater lamps, reducing the sardine fleet's gas consumption by nine-tenths.

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THIRD TRIP OF FROZEN TUNA LANDED AT MAHDIA:

A Japanese fishing vessel has landed a trip of 100 metric tons of frozen tuna at the

Tunisia (Contd.):

Tunisian port of Mahdia. This trip is the third landed during the summer of 1960 for the fish-canning industry. (United States Embassy in Tunis, September 13, 1960.)



Union of South Africa

FISH PRODUCTION NOT CURTAILED IN SPITE OF BOYCOTTS:

The South African Fish Cannery Association, representing all producers of canned fish in the inshore fishing industry in the Union and South West Africa, after considering the effects which the recent imposed boycotts by African nations on South African products may have on the economy of the fishing industry, stated August 5, 1960, that at this stage there would be no curtailing of production nor any contemplation of retrenchment of factory staffs and fishermen.

Over the last five years the industry has pursued a vigorous policy of building up export markets in many countries. This policy has been successful and will now be intensified. Wherever possible, alternative markets will be found.

Any further extension of the boycott movement may possibly lead to diversion of more raw fish supplies to the production of meal. While international fish-meal markets are presently depressed as a result of over-production in Peru, a representative of the Union is attending talks in London, preparatory to an international convention of fish-meal manufacturers scheduled for September in Paris. It is hoped that some workable plan will be evolved whereby fish-meal producing countries will be able to enjoy more stable and more profitable export prices for the product. (United States Consulate, Cape Town, August 24, 1960.)

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PILCHARD-MAASBANKER 1960 LANDINGS SET NEW RECORD:

The 1960 pelagic shoal-fishing season on the Union of South Africa's Cape west coast closed at midnight on July 31, with a new record catch of 423,524 short tons, comprising 350,361 tons sardine or pilchard, 45,800 tons maasbanker, and 27,363 tons

mackerel. This is the third successive year that the industry has had record landings. With the pilchard haul at South West Africa's Walvis Bay likely to be well over 300,000 tons, the total 1960 catch for the Union and South West Africa will be almost 900,000 tons.

Pilchard fishing will re-open on January 1, 1961. Mackerel and maasbanker fishing will open on November 1, 1960, and continue with pilchard fishing until July 31, 1961.

The recovery from the lean 1955/56 period has been sustained and for the first time in the history of the industry the official "quota" limit has been caught before the end of May. In anticipation the industry initiated discussions with the Director of Fisheries earlier in the year with the result that for 1960 at least, the tonnage limit on fish landed has been abandoned and replaced by a time limit in the Union of South Africa.

Although in 1960 the pelagic fish schools appeared up to July 31 over a wider area than in the previous few years, most catches were made in waters far south of the main concentration of factories. This has called for heavy investment in large vessels.

For the two fish meal factories in the Cape Peninsula, 1960 brought big increases in production. According to reports, one company processed 26,476 short tons of fish in the first six months of the season, compared with 16,990 tons last year. The second firm increased its intake from 27,653 to 38,752 tons.

The outstanding catches and high production figures of the Union's west coast factories have been partly offset--first by the depressed prices for fish meal on world markets, and, more recently, by political boycotts of South African products in some important markets.

Although South African fish meal did not drop to the £22 (about US\$62) a ton paid for Peruvian meal, the price is low enough to alarm producers. And some form of rationization of fish meal production and marketing on an international basis was likely to be a priority subject at the Paris meeting in September of the International Convention of Fish Meal Manufacturers.

The fish meal price coupled with a worldwide demand for canned fish may result in a

Union of South Africa (Contd.):

record output this year from South and South-West African canneries. In the Cape, production is restricted by the long distance that pilchards have to be carried from fishing grounds to the canneries in Saldanha and St. Helena Bay. But in Walvis Bay, where catches are made much closer to the factories, production was considerably higher than last year. By the end of June, one Walvis factory had nearly trebled its canned fish output of the same period last year.

With Ghana and Malaya boycotting South African products, some valuable markets have been lost and the effect will be felt by canners and by producers of dried fish, which has had a growing sale in Central and West Africa.

At least two South African fish-meal factories are packing part of their production in paper bags. These are exported to Germany where the paper bag is preferred. Towards the end of the season, one firm was packing in a bright yellow bag with a plastic layer. (The South African Shipping News and Fishing Industry Review, August 1960.)

* * * * *

TWO VESSELS FISH TUNA WITH JAPANESE LONG-LINE GEAR:

As a result of tests now being carried out from two boats operating off the South African Cape coast, the Japanese long-line method of tuna fishing may one day be introduced to the South African fishing industry. Catches are reported to be encouraging. In one two-day fishing period the South African research boat Kunene landed 53 tuna weighing 3,840 pounds. The 70-ft. Kunene is one of two new wooden craft designed for the pilchard research program of the Union's Division of Fisheries. With her sistership Trachurus and the larger steel-built vessel Sardinops, the Kunene is occupied most of the time in the long-range pilchard research program. But for part of each month, usually about five days, she is used by the Division to test new fishing methods which may help to improve and diversify the fishing effort in South Africa.

The possibilities of tuna fishing in South African waters have long interested fishery scientists, fishermen, and industrialists. The fish are known to occur in considerable quantities off the Cape; they are caught by big-game fishermen, and the recent tests indicate that they may be available in sufficient concentration for commercial fishing.

The Kunene started the South African long-line tests towards the end of last year; the gear was imported from Japan. For a while the Kunene worked alone, but early this year a South African firm, in cooperation with the South African Museum and its Marine Biologist, also started long-line tests. These are now being carried out between Slangkop and Port Elizabeth, and the Kunene is operating north-west of Slangkop.

Using five baskets of 3/16-inch diameter Kuralon line, nearly a mile in length, the Kunene is working with six

branch lines to a basket. Each branch line is about 12 fathoms long and is attached by dog clip to the main line. Glass float bubbles of about 20-lb. displacement are used. Hooks are baited with pilchards or mackerel, and are left in the water for 45 to 60 minutes before the line is pulled in by the boat's hydraulic line-hauler.

The best result to date was a catch made during a two-day period in oceanic water temperature 17° C. (62.6° F.) 60 miles west of Cape Town. The first set was made at daybreak, the setting taking ten minutes. After periods of from 45 to 60 minutes the hooks were hauled in. In all, the line was set seven times over the two days to give an equivalent of 210 hooks, which caught 53 tuna weighing a total of 3,840 pounds. Included in the catch were 15 big-eyed tuna (averaging 100-lbs. each); also albacore and bluefin. The fish ranged from 40 pounds to 170 pounds each in weight.

This was the most encouraging catch made by the Kunene and is regarded as a hopeful indication that the fish are available and can be exploited commercially.

While the Kunene is employed on long-line tests, her sister vessel Trachurus has been trying out a Canadian-type midwater trawl designed to be worked by one boat. The trawl, which is for fishing at intermediate depths, has not had much success with pilchards and mackerel. (The South African Shipping News and Fishing Industry Review, June 1960.)



U.S.S.R.

FISHING AND WHALING FACTORYSHIPS TO BE BUILT IN WEST GERMANY:

The "Sudoimport" in Moscow has ordered two super factoryships of 18,000 and 25,000 dead-weight tons, respectively, from a West German shipyard. The two large fishing and whaling factoryships will cost a total of 220 million kroner (US\$30.8 million). Keels will be laid early in 1961 and the vessels delivered the same year. The vessels will be about 180 meters (590.4 feet) long, 22.8 meters (74.8 feet) in breadth, and 8 meters (26.2 feet) deep.

The vessels will hunt whales for a short period in the tropic zone of the Pacific Ocean, and also catch fish in the tropics, off West Africa, Newfoundland, Greenland, and in the Arctic Ocean.

After the whaling season, the vessels will mount complete fish plants on the flensing deck to quick-freeze fish fillets, and produce fish meal and liver and vitamin oils. There will be fish oil tanks holding 11,000 cubic meters, cold-storage rooms (32,000 cubic meters) for fish fillets, and 4,400 cubic meters of fish-meal storage. The 6,250-hp. Diesel engine will give a speed of 14 knots.

The special requirements requested by the Russians included a landing place for

U.S.S.R. (Contd.):

helicopters, operating rooms, printshops, motion picture salons, and even Finnish baths.

With this order, the State-owned West German shipyard has received orders for vessels totaling 850 million kroner (US\$119.0 million) from the Russians, including 24 fish factory-ships of the Pushkin class, repairs of ships, and 3 fast fruit refrigerator ships. (Fiskaren, August 17, 1960.)

TRANSPANTED PACIFIC SALMON CAUGHT IN BARENTS AND WHITE SEAS:

Tens of thousands of transplanted Pacific salmon were caught for the first time this summer in the Barents and White Seas, according to information from Moscow published in a Japanese newspaper (August 29, 1960). This means the Russians have succeeded in transplanting salmon from the Pacific Ocean to the North Arctic Sea. The salmon were grown artificially from fertilized spawn taken from Saghalin. It is reported that some transplanted salmon were also caught off Norway.

12-MILE TERRITORIAL WATERS LIMIT ENACTED:

According to a wire from Moscow received in Tokyo, the Soviet Government has decreed through an official publication of its Highest Conference, a 12-mile limit for its territorial maritime waters. The decree was enacted and signed by Soviet President Leonid Brezhnev on August 5, 1960. This is the first time Russia has enacted a law officially promulgating territorial waters of 12 miles. (Japanese newspaper, September 8, 1960.)



Venezuela

SHRIMP INDUSTRY:

The fishing industry is not well developed in Venezuela. Modernization of fishing methods and processing and marketing techniques are necessary before Venezuela can satisfy domestic demand. The only organized part of the industry is the sardine canners.

Shrimp fishing occurs on the western shores of Lake Maracaibo; the coast of the Gulf of Venezuela; the coast of Anzoategui; between the mainland and the Island of Margarita; and on the mainland coast of the Gulf of Paria. Vessels take a mixed catch. There is a canning plant in Maracaibo and a freezing plant in Puerto la Cruz. The plant in Maracaibo canned shrimp in 1957, but there was

no production in 1958. In 1959, some shrimp were packed (about 5.8 metric tons) in cans of 120 grams (3.9 ounces) divided about equally between wet and dry pack. The retail price in August 1960 was 2.75 bolivars per can (US\$0.83). The plant in Puerto la Cruz produced 10 metric tons of frozen shrimp in 1959. Their estimate for three months' operation in 1960 is 12 tons. This plant purchases its shrimp from fishermen using shore nets or small in-board craft. Shrimp production for the canning season of 1960 has been poor because of dry weather affecting the grounds in the mouth of the Unare River. As of August 1960, no shrimp were for sale in Puerto la Cruz.

Table 1 - Venezuela's Shrimp Landings, 1956-1959^{1/}

Year	Quantity			Value		
	Metric Tons	Bolivars	US\$	Bolivars	US\$	
1959	1,588	2,324,955	697,487			
1958	1,128	1,592,942	477,883			
1957	974	2/	-			
1956	723	2/	-			

^{1/}Includes camarones, "lagostinos"—*Panesus schmitti* Burkenroad, and *Xiphopenaeus* *lucayi*.
^{2/}Not known.

It is estimated that the 1960 catch will drop due to restrictions on otter trawling. Some 16 of the 32 trawlers operating in the eastern part of Venezuela have been put out of business by restrictive regulations.

Table 2 - Venezuela's Shrimp Exports, 1957-59^{1/}

Year and Destination	Quantity			Value		
	Metric Tons	Bolivars	US\$	Bolivars	US\$	
1959:						
Curacao, Netherlands Antilles ..	0.2	1,172	352			
United States ..	0.5	2,560	768			
Total	0.7	3,732	1,120			
1958:						
Curacao, Netherlands Antilles ..	0.7	3,676	1,103			
Puerto Rico	1.5	9,045	2,714			
United States	2.9	15,678	4,703			
Total	5.1	28,399	8,520			
1957:						
Curacao, Netherlands Antilles ..	1.1	5,000	1,500			
United States	7.3	20,358	6,107			
Total	8.4	25,358	7,607			

^{1/}Includes fresh, frozen, and canned shrimp.

There are no export controls or taxes on shrimp in Venezuela. (United States Embassy, Caracas, August 25, 1960.)

Note: Values converted at rate of 1 bolivar equals US\$0.30.



Yugoslavia

BAN LIFTED ON IMPORTS OF FROZEN JAPANESE TUNA:

Commercial negotiations between Yugoslavia and Japanese trading firms are in progress since it seems that the Yugoslavian

Yugoslavia (Contd.):

Government has lifted its ban on the issue of import licenses for frozen Japanese tuna. It was reported that the Yugoslavian Government decided to issue a license for the import of 4,500 metric tons of frozen Japanese tuna from September to December 1960. Yugoslavia had banned the import of frozen Japanese tuna from June through August 1960.

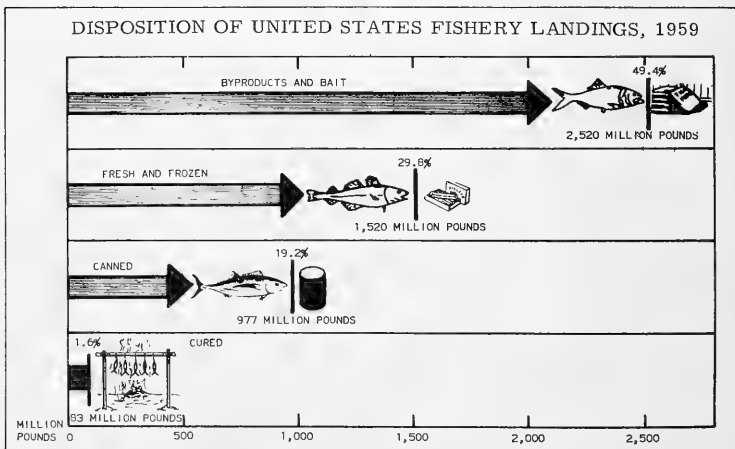
It was reported that the Yugoslavian buyers had mentioned a price as low as \$210 a metric ton c. & f. but the Japanese countered with \$250 or over because the Italian market was improving. Immediately after the abolition of the conference rate of tuna for shipments to Italy in mid-August, some sales at \$220 c. & f. Italy or \$180 a metric ton f.o.b. Dakar were not unusual. However, catches and shipments by Japanese fishing vessels operating in the Atlantic Ocean dropped and the price rose to \$230 a ton c. & f. Also, prices offered for frozen Atlantic tuna ship-

ped to the United States via intermediate ports firmed up. The price for albacore tuna delivered at Cristobal has bounced back to \$280-290 a ton.

* * * * *

FROZEN TUNA IMPORTS FROM JAPAN BANNED FOR THREE MONTHS:

Yugoslavia stopped issuing licenses for imports of Japanese frozen tuna from June through August 1960 for two reasons: (1) exports of Yugoslavian canned tuna to both eastern and western Europe were extremely light early this year, and stocks on hand in Yugoslavia were greater than the domestic market could absorb; (2) sardine fishing in the Black Sea and off the Turkish coast was very good, and the canneries would keep operating without imports of frozen tuna. This caused cancellation of orders from Japan--about 2,500 metric tons of frozen tuna were involved, which was the amount planned for export to Yugoslavia for June-August.





FEDERAL ACTIONS



Department of the Interior

EXPLOITATION OF FLORIDA CORAL REEF PRESERVE TO BE STOPPED:

Approval of regulations protecting the Key Largo Coral Reef Preserve off the Florida coast was announced on September 19 by the Acting Secretary of the Interior Elmer F Bennett.

The regulations become effective on the tenth day after publication in the Federal Register. This emergency action is necessary because of commercial exploitation of the coral structure in the Preserve. This exploitation consists of blasting, dredging, and otherwise defacing or destroying the underwater scenic beauties of the area.

The regulation will prohibit the removal or destruction of the natural features or the shells and shellfish, starfish, and other marine invertebrates of the Preserve; dredging, filling, excavating, or any building; dumping refuse or otherwise polluting the area; tampering with wrecks or cargoes which might be within the boundaries.

Spear fishing and the use of poisons or electric-shocking devices are prohibited but skin diving with camera, for pleasure or observation, is permitted. Scientific specimens may be collected only on permit. No watercraft can be operated in any way that will damage the natural features of the Preserve. Possession or use of firearms, air guns, bows and arrows, slings, spears, harpoons, or any other type of weapon is prohibited.

Key Largo Coral Reef Preserve is a natural coral reef lying on the continental shelf off the southern tip of Florida. It lies partly within and partly without Florida's three-mile limit. It is approximately 21 miles long and about 4 miles wide. It has been made into a preserve by separate but coordinated actions by the State of Florida and the United States.

The United States action was taken March 15, 1960, by a proclamation issued by the President. Florida has recently issued regulations similar to those which are now being promulgated by the Department.

FISH AND WILDLIFE SERVICE BUREAU OF COMMERCIAL FISHERIES

FISHING VESSEL CONSTRUCTION DIFFERENTIAL SUBSIDY ANNOUNCED:

Regulations governing payment of construction differential subsidies for fishing vessels were published in the Federal Register of September 22, 1960. In the closing days of the 86th Congress, \$750,000 was appropriated for construction differential payments.

Payments of not to exceed 33 $\frac{1}{3}$ percent of the cost of the fishing vessel to be constructed may be paid under certain very restrictive conditions. Among these, is a requirement that the fishery in which the vessel will fish must be suffering injury or threat of injury by reason of increased imports of a like or similar product.

Other requirements are that the applicant possess the ability, experience; resources, and other qualifications necessary to enable the enterprise to operate successfully; that the vessel be suitable for use in the fishery and for use by the United States for national defense or military purposes during time of war or national emergency; that the vessel will deliver its full catch to ports of the United States except under "force majeure;" that only citizens or aliens legally domiciled in the United States will be employed on the vessel; and that the new vessel will aid in the development of the United States fisheries under conditions that the Secretary considers to be in the public interest.

The regulations as they appeared in the Federal Register follow:

Title 50—WILDLIFE

Chapter II—Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior

SUBPART F—AID TO FISHERIES

PART 256—FISHING VESSEL CONSTRUCTION

Differential Subsidy Procedures

On page 7538 of the FEDERAL REGISTER of August 10, 1959, there was published a notice and text of a proposed new part, Part 166, Title 50, Code of Federal Regulations. Part 166 has now been changed to Part 256 in keeping with the format of the revised edition of 50 CFR. Wildlife published in the FEDERAL REGISTER of September 1, 1960. The purpose of the new part is to issue regulations governing the payment of fishing vessel construction differential subsidies.

Interested persons were given 30 days within which to submit written comments, suggestions or objections with respect to the proposed new part. No comments, suggestions or objections have been received, and the proposed new part is hereby adopted with only an editorial change in the language of § 256.4 to provide more flexibility in the submission of detailed plans for the vessel proposed to be constructed. This new part shall become effective at the beginning of the 30th calendar day following the date of this publication in the FEDERAL REGISTER.

Part 256 reads as follows:

- Sec. 256.1 Basis and purpose.
256.2 Definitions.
256.3 Eligibility requirements.
256.4 Application.
256.5 Subsidy contract.
256.6 Inspection of vessels.
256.7 Payment of subsidy.

AUTHORITY: §§ 256.1 to 256.7 issued under section 10, Pub. Law 85-616.

§ 256.1 Basis and purpose.

(a) The Act of June 12, 1960 (P.L. 86-516), authorizes the Secretary of the Interior to pay a subsidy for the construction of fishing vessels in shipyards of the United States.

(b) The purpose of this part is to prescribe the rules and regulations governing the payment of these subsidies.

§ 256.2 Definitions.

(a) *Secretary.* The Secretary of the Interior or his authorized representative.
(b) *Administrator.* The Maritime Administrator in the Department of Commerce or his authorized representative.
(c) *Person.* Individual, association, partnership, or corporation, any one or all as the context requires.

(d) *Fishery.* A segment of the commercial fishing industry engaged in the catching of a single species or a group of species of fish or shellfish. To be considered as operating in a fishery the catch of such species during the calendar year must amount to at least fifty-one percent (51%) of the aggregated (by vessel weight) of the total catch of the vessel.

§ 256.3 Eligibility requirements.

(a) Injury or threat of injury due to increased imports. Applicants for a subsidy for a vessel to be operated in a fishery which does not qualify under section 4(1) of the Act or which has not been previously found to be injured or threatened with injury by reason of increased imports must present evidence of injury or threat of injury by reason of increased imports. Upon receipt of such evidence, the Secretary will announce by notice in the FEDERAL REGISTER and by notice in writing by registered

mail to parties of record, that factual data may be filed in support of or opposition to, such a finding during the succeeding 90 days. All data filed will be considered, along with such information as may be developed by the Secretary's staff or staffs of other Government agencies and a finding announced by the Secretary. This finding will remain in effect until the Secretary shall announce that he has reason to believe that the injury or threat of injury or the threat of injury removed. Interested parties will then have 30 days to submit data, after which the Secretary will determine whether or not the injury or threat of injury remains. Injury or threat of injury may be determined, without excluding other factors, by downward trend of production, employment, prices, profits, or wages in the domestic fishery concerned, or a decline in sales, an increase in imports, either actual or relative, a higher or growing inventory, or a decline in the proportion of the domestic market supplied by the domestic fishery concerned.

(b) Aid in the development of the United States fisheries. For a vessel to aid in the development of the United States fisheries under conditions that the Secretary considers to be in the public interest, the vessel must be a modern vessel which will tend to upgrade the fleet and, unless of completely new and advanced design, shall not operate in a fishery which the Secretary deems to have sufficient vessels to economically harvest either the maximum sustained yield of the fishery or the maximum amount which can be marketed in an orderly manner.

§ 256.4 Applications.

Applications for a subsidy shall be made on forms prescribed by the Secretary and shall be filed with the Director, Bureau of Commercial Fisheries, Washington, D.C. The applications must be accompanied by three copies of the cross section, outboard profile, and specifications of the proposed vessel. The Secretary may require such additional complete detailed construction plans as may be necessary after a review of the application and accompanying plans and specifications.

§ 256.5 Subsidy contract.

(a) A contract for the payment of the subsidy will take effect when all contracts between the applicant for such subsidy and the shipbuilder, who is to construct such vessel, have been approved by the Administrator and the subsidy contract has been signed by the Secretary and the applicant; and
(b) The contract shall contain a formula for the computation of the amount of the subsidy that shall be repaid to the Secretary in the event the vessel is operated in any fishery other than the particular fishery for which it was designed as defined in § 256.2(d).

§ 256.6 Inspection of vessels.

The Secretary or the Administrator shall have access at all times to all vessels which are being constructed under a contract providing for a construction subsidy provided for by the Act.

§ 256.7 Payment of subsidy.

The subsidy will be paid to the applicant after the vessel is completed and evidence of full payment to the shipyard constructing the vessel is presented; or jointly to the applicant and the shipyard upon completion and delivery of the vessel.

FRED G. ANDBAHL,
Acting Secretary of the Interior.
SEPTEMBER 16, 1960.

Note: Also see Commercial Fisheries Review, October 1960 p. 96.

Department of Labor

WAGE AND HOUR AND PUBLIC CONTRACTS DIVISION

MINIMUM WAGE FOR TUNA CANNING AND PROCESSING RAISED TO UNITED STATES LEVEL:

A minimum wage rate in Puerto Rico of \$1 an hour for tuna canning and processing operations was announced by the Wage and Hour Division of the U. S.

Department of Labor and published in the September 10, 1960, Federal Register. The wage order as published gives effect to recommendations of the U. S. Department of Labor Industry Committee No. 49-A for the Food and Related Products Industry in Puerto Rico.

This raises the Puerto Rican wage rate to the same minimum level as that which prevails on the United States mainland.



The section of the order (which becomes effective September 25, 1960) titled "The yeast and canned tuna fish classification" as published states: "Wages at a rate of not less than \$1.00 an hour shall be paid under section 6 of the Fair Labor Standards Act of 1938 by every employer to each of his employees in the food and related products industry in Puerto Rico who is engaged in commerce or in the production of goods for commerce who is also engaged in the yeast and canned tuna fish classification of that industry, which is defined as the manufacture of yeast, and the cooking and canning of tuna fish and of tunalike fish and the manufacture of byproducts therefrom." A wage rate of 85 cents an hour has been in effect since November 17, 1958. The new wage order means an hourly increase of 15 cents. While the tuna canning and processing industry in Puerto Rico comes under the \$1.00 an hour minimum wage, all other types of food canning and preserving have a wage rate of 80 cents an hour (previous rate was 70 cents), and other types of general food processing a rate of 85 cents (previous rate 75 cents) an hour under the new order.

The Fair Labor Standards Act as amended in 1958 provides special industry committees to biennially review and recommend minimum hourly wage rates for Puerto Rican industries operating at or below the \$1.00-an-hour statutory minimum that applies on the mainland. The U. S. Department of Labor appointed Industry Committee No. 49-A to recommend hourly wage rates for the food and related products industry in Puerto Rico. The Committee held its public hearing on August 15 in San Juan, Puerto Rico, and recommended the increase in the minimum wage.

In the "Report, Findings of Fact, and Recommendations of Industry Committee No. 49-A for the Food and Related Products Industry in Puerto Rico," the Committee's findings and recommendations for the Yeast and Canned Tuna Classification were:

"This classification is presently composed of two establishments with 446 covered employees. One firm is a manufacturer of dry yeast employing 13 workers covered by the minimum wage provisions of the Fair Labor Standards Act, and the other manufactures canned tuna fish with a total of 433 covered employees. At the time of the 1958 survey these same two establishments employed a total of 367 covered workers. According to a witness testifying in behalf of a newly-organized firm, it is contemplated that several hundred additional persons will shortly be engaged in the production of canned tuna fish and byproducts. . . .

"Under the provisions of a union contract covering workers at the operating tuna fish cannery at the time of the Wage and Hour Division survey, wage rates ranged from 90 cents an hour to \$1.65 an hour, and there was provision for an increase of 5 cents an hour for all job classifications on October 10, 1960. As a result of a recent election, the employees of this plant are now represented by another union. Average hourly earnings in the plant amounted to over 96 cents an hour at the time of the survey. A company representative appearing before the Committee stated that the company did not claim inability to absorb wage increases. The most recent data available to the Committee indicates that in 1957 the firm had a net profit of 7.1 percent on almost \$5 million sales, and in 1958 it had a profit of 9.7 percent on sales of \$5.6 million. From June 1, 1957, to May 30, 1959, the firm's earned surplus increased from \$77,631 to \$1,306,213.

"On the basis of the entire record, therefore, the committee finds that a minimum wage rate of \$1.00 an hour for the Yeast and Canned Tuna Fish Classification is economically feasible at this time and that this rate will not result in a substantial curtailment of employment in the industry. It is obvious that since this is the statutory minimum rate presently applicable elsewhere in the United States, the recommended rate will not give industry in Puerto Rico a competitive advantage over industry in the United States outside of Puerto Rico. This minimum wage rate will directly affect about 82 percent of the workers in the classification and cause an estimated direct increase in the classification wage bill of about 7 percent. . . .

"Wages at a rate of not less than \$1.00 an hour shall be paid in the Yeast and Canned Tuna Fish Classification of the Food and Related Products Industry, and this classification shall be defined as the manufacture of yeast, and the cooking and canning of tuna fish and of tuna-like fish and the manufacture of by-products therefrom. . . .

Note: Also see Commercial Fisheries Review, Oct. 1960 p. 97, Jan. 1959 p. 82.



U. S. Tariff Commission

FINAL REPORT ON TARIFF SIMPLIFICATION STUDY ISSUED:

The U. S. Tariff Commission released on November 15, 1960, the final report on its tariff classification study. The report constitutes a recommendation to Congress for revision of the customs laws under which imported articles are classified for tariff purposes.

The study was undertaken by the Commission pursuant to Section 101 of the Customs Simplification Act of 1954. It was intended to lead to a proposal, for Congressional consideration, to simplify and modernize the tariff schedules. The study was not directly concerned with tariff rates.

The Tariff Commission's final report consisted of ten volumes, one of which was Schedule I--Animal and Vegetable Products. An early version of this volume was issued by the Commission in 1958 and was the subject of public hearings.

Note: Copies of each volume in the final report are available for purchase from the U. S. Government Printing Office.

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SHRIMP INDUSTRY INVESTIGATION:

In response to a resolution of the Senate Committee on Finance, the U. S. Tariff Commission, under the authority of section 332 of the Tariff Act of 1930, as amended (19 U.S.C. 1332), on September 12 announced and instituted an investigation of the domestic shrimp industry (including fishing, processing, and other related operations), and of imports of shrimp and shrimp products provided for in paragraph 1761 of the Tariff Act of 1930.

The resolution directs the Commission to include in its report to the Committee on Finance the facts relative to United States and world production, and trade; imports; domestic supplies and consumption; the possibilities of world over-production; the interests of consumers, processors, and producers; foreign and domestic wage rates; costs of transportation to principal consuming centers; supplies of shrimp available to domestic and foreign fishermen; and other pertinent factors.

The resolution also directs the Commission to include in its report an analysis of the possible results of an imposition of a duty of 35 percent on all imports of shrimp and shrimp products as provided in paragraph 1761 of the Tariff Act of 1930 as well as an analysis of the possible results of a tariff quota under which all imports not in excess of the imports in the calendar year 1960 shall enter free of duty and all imports in excess of those in 1960 shall be dutiable at 50 percent ad valorem.

A public hearing, at which interested parties will be given opportunity to be present and to be heard, will be held in connection with the investigation in the Hearing Room of the Tariff Commission, Washington, D. C., beginning on January 9, 1961. (Notice published in Federal Register of September 15, 1960.)

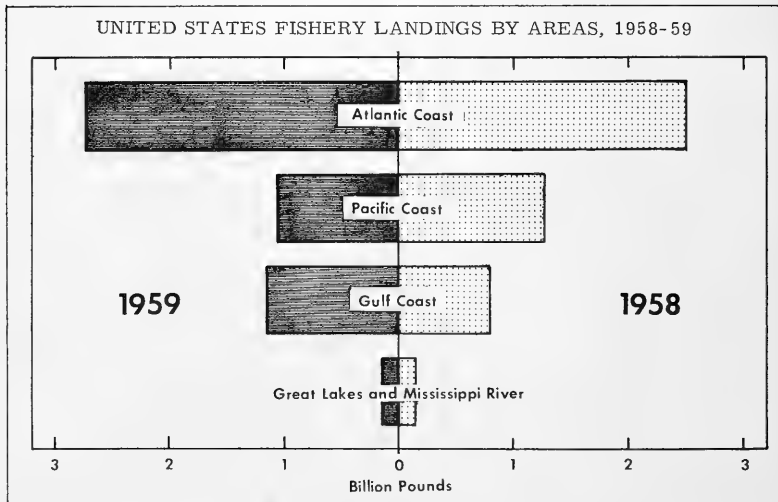
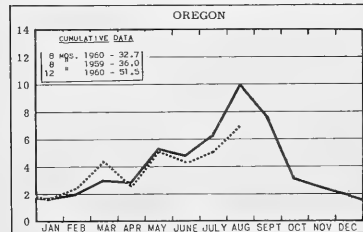
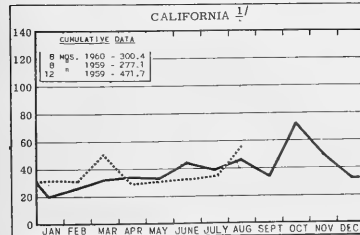
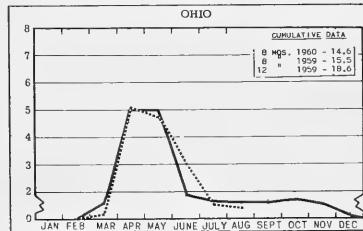
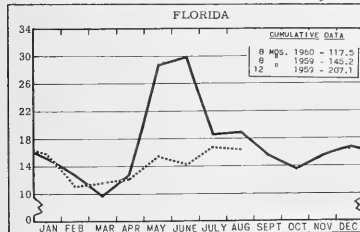
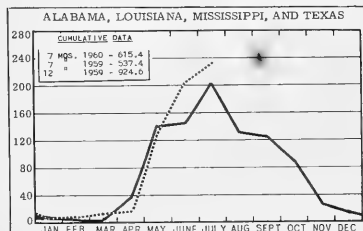
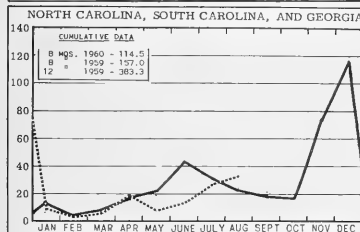
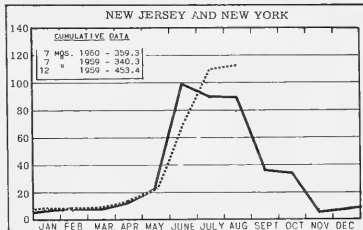
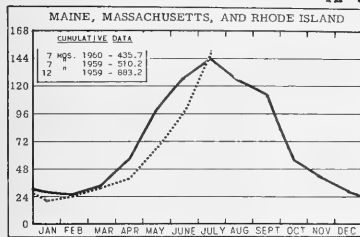




CHART I - FISHERY LANDINGS for SELECTED STATES

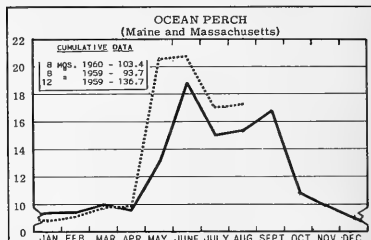
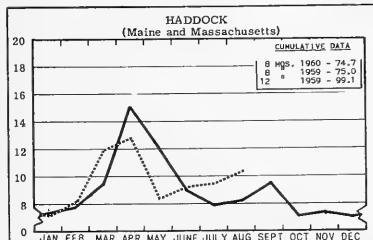
In Millions of Pounds



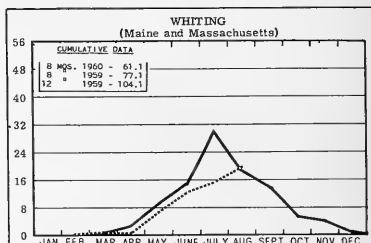
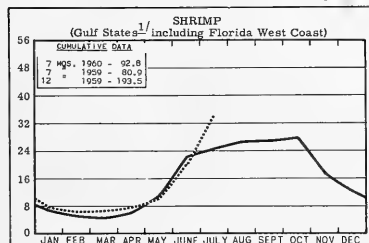
^{1/2} ONLY PARTIAL—INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

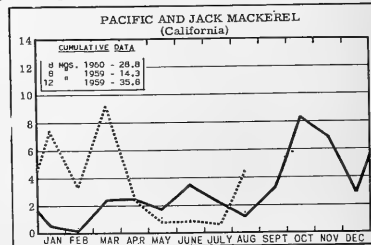
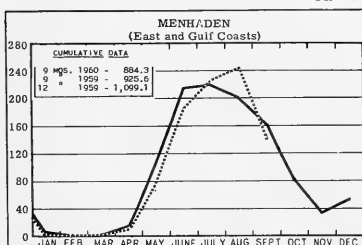


In Millions of Pounds



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

In Thousands of Tons



In Thousands of Tons

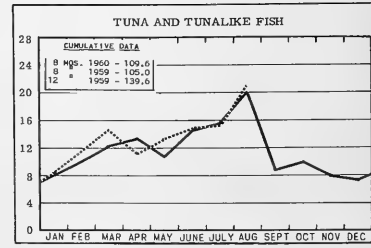
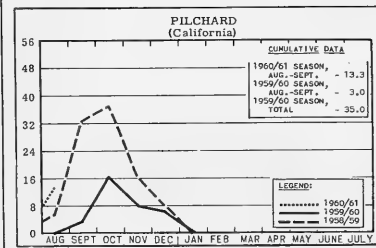
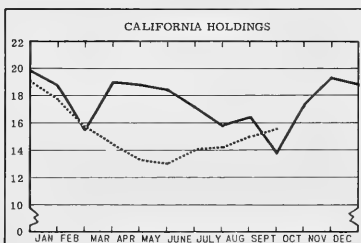
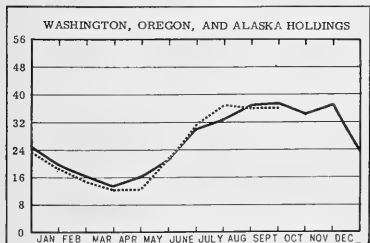
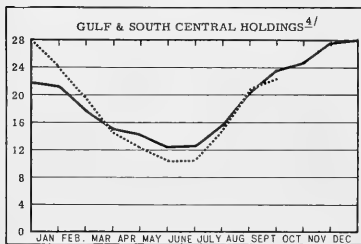
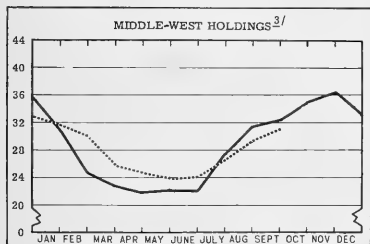
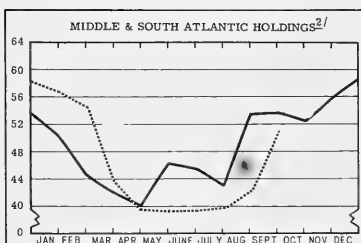
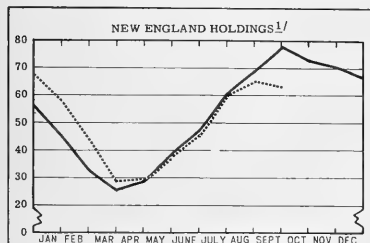
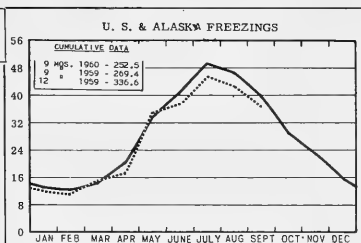
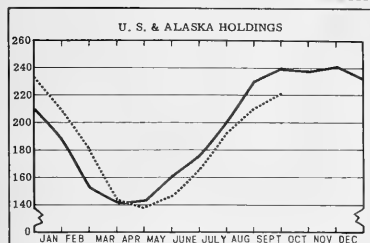


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

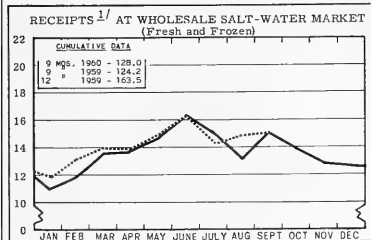
In Millions of Pounds



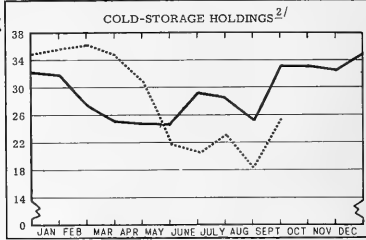
* Excludes salted, cured, and smoked products.

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

In Millions of Pounds

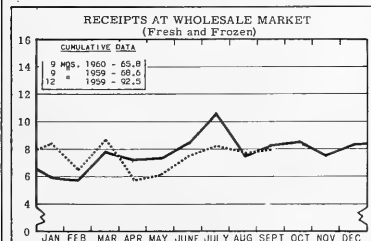


NEW YORK CITY

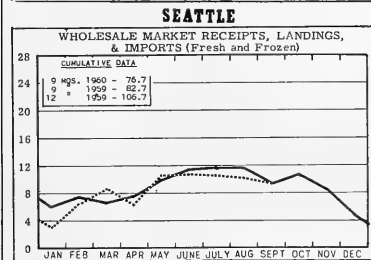
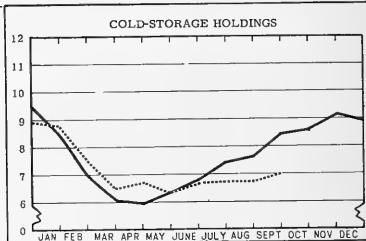


^{1/}INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

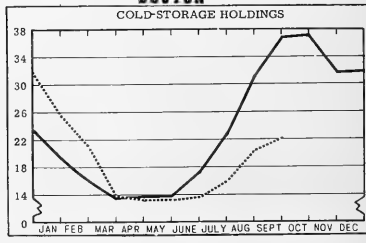
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



BOSTON



LEGEND:
 1960
 ——— 1959

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

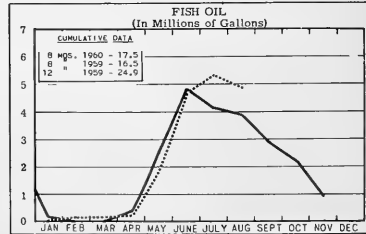
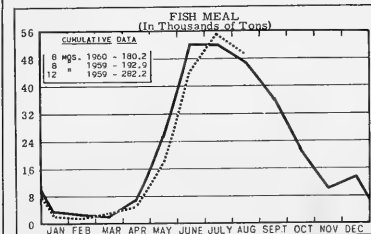
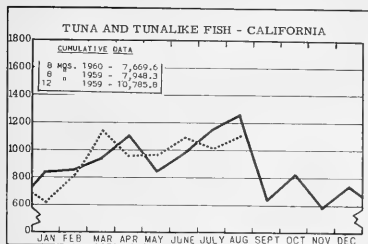
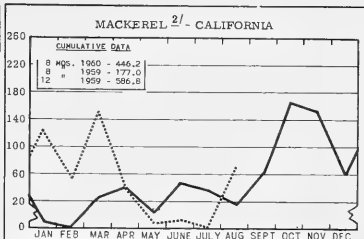


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

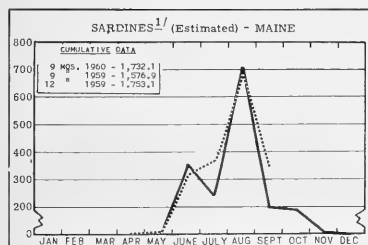
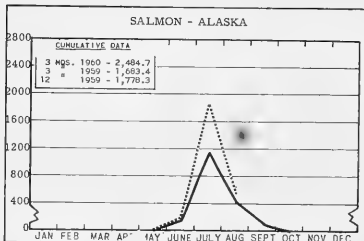
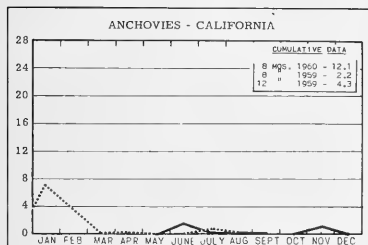
In Thousands of Standard Cases



LEGEND:
 1960
 ——— 1959
 - - - 1958



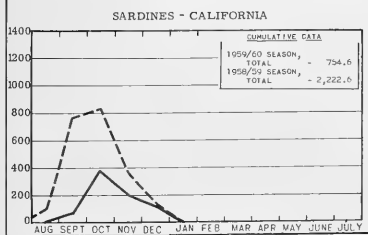
^{2/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING.

STANDARD CASES

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



LEGEND:
 1960/61
 ——— 1959/60
 - - - 1958/59

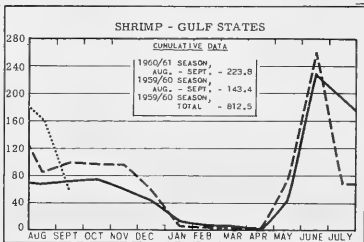
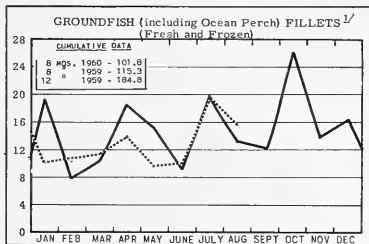
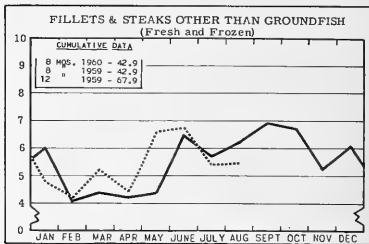


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

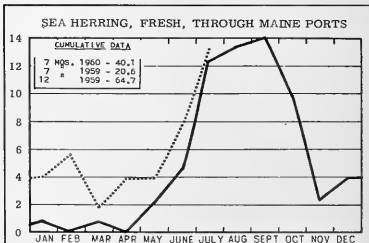
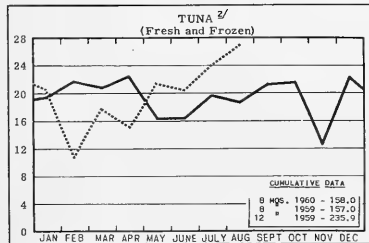
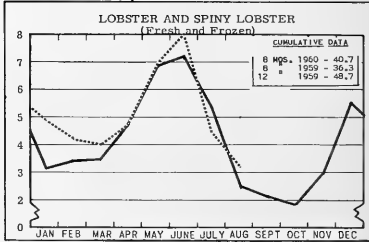
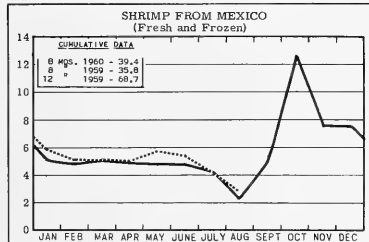
In Millions of Pounds



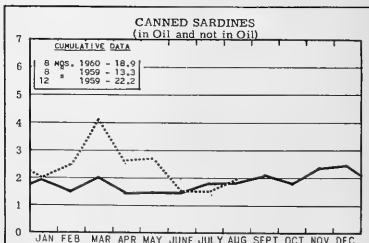
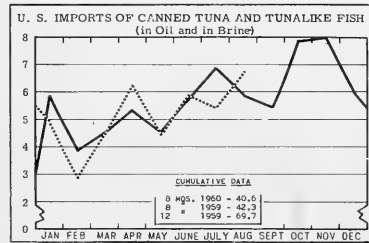
LEGEND:
..... 1960
———— 1959



^{1/2}SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1960.



^{2/2} EXCLUDES LOINS AND DISKS.





RECENT FISHERY PUBLICATIONS

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.
 FL - FISHERY LEAFLETS.
 SL - BRANCH OF STATISTICS LIST OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 SSR. - FISH. - SPECIAL SCIENTIFIC REPORTS - FISHERIES (LIMITED DISTRIBUTION).
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-2363	- Massachusetts Landings, May 1960, 5 pp.
CFS-2365	- Virginia Landings, June 1960, 3 pp.
CFS-2369	- South Atlantic Fisheries, 1959 Annual Summary, 6 pp.
CFS-2370	- Frozen Fish Report, July 1960, 8 pp.
CFS-2372	- Maine Landings, May 1960, 3 pp.
CFS-2373	- New York Landings, June 1960, 4 pp.
CFS-2375	- Shrimp Landings, May 1960, 6 pp.
CFS-2376	- Rhode Island Landings, June 1960, 3 pp.
CFS-2382	- Ohio Landings, June 1960, 2 pp.
CFS-2377	- Massachusetts Landings, June 1960, 5 pp.
CFS-2378	- Virginia Landings, July 1960, 3 pp.
CFS-2379	- Mississippi Landings, May 1960, 2 pp.
CFS-2380	- Maryland Landings, July 1960, 3 pp.
CFS-2381	- North Carolina Landings, July 1960, 3 pp.
CFS-2383	- South Carolina Landings, July 1960, 2 pp.
CFS-2384	- Texas Landings, June 1960, 3 pp.
CFS-2385	- Georgia Landings, July 1960, 2 pp.
CFS-2386	- Maine Landings, June 1960, 3 pp.
CFS-2387	- California Landings, May 1960, 4 pp.
CFS-2389	- Florida Landings, July 1960, 7 pp.
CFS-2391	- Shrimp Landings, June 1960, 6 pp.
CFS-2392	- Rhode Island Landings, July 1960, 3 pp.

FL-336ss - Commercial Fisheries Outlook, July-September 1960, 44 pp.

FL-499 - Federal Fishing Vessel Mortgage and Loan Insurance, 14 pp., July 1960. Describes the Fishing Vessel Mortgage and Loan Insurance Program administered by the Bureau of Commercial Fisheries. This provides for the insuring of mortgages given to assist the construction, reconstruction, and reconditioning of fishing vessels in a manner similar to the mortgage insurance provided by the Federal Housing Administration for houses. Discusses the authority for the program, its purpose, credit requirements, eligible mortgages and loans, premium rates for both types of insurance, applications, investigation fees, commitments to insure, closing procedures, and defaults.

FL-503 - Fishing Vessel Construction Differential Subsidy, 12 pp., processed, September 1960. A leaflet containing general information about the Fishing Vessel Construction Subsidy Program, administered by the U. S. Bureau of Commercial Fisheries. Describes the enacting of the enabling legislation for the program, Public Law 86-516; its purpose of providing financial assistance to correct inequities between foreign and domestic costs of construction of fishing vessels; applications for benefits; and eligibility requirements. It also presents details on the processing of applications; requirements for construction of vessels; and determination and payment of a subsidy.

Wholesale Dealers in Fishery Products, 1959 (Revised):

- SL-1 - Maine.
 SL-24 - Minnesota (Lakes Area).
 SL-32 - Minnesota (Mississippi River and Tributaries).
 SL-33 - North Dakota (Mississippi River and Tributaries).
 SL-36 - Iowa (Mississippi River and Tributaries).
 SL-37 - Kansas (Mississippi River and Tributaries).
 SL-38 - Missouri (Mississippi River and Tributaries).
 SL-42 - Kentucky (Mississippi River and Tributaries).
 SL-44 - Nebraska (Mississippi River and Tributaries).
 SL-48 - Indiana (Mississippi River and Tributaries).
 SL-49 - South Dakota (Mississippi River and Tributaries).

SSR-Fish. No. 325 - Observations on Habits and a Method of Trapping Channeled Whelks Near Chatham, Massachusetts, by William N. Shaw, 9 pp., illus., May 1960.

SSR-Fish. No. 340 - Further Experiments in Fishway Capacity, 1957, by Carl H. Elling, 18 pp., illus., May 1960.

SSR-Fish. No. 343 - Manufacturing Plant Food Services as Markets for Fish and Shellfish, 35 pp., May 1960. This report identifies and examines the market for fish and shellfish afforded the fishing industry by the employee food services maintained by manufacturing establishments for their employees. Important differences in the use of fish and shellfish are found, depending on number of employees, location or plant, species of fish, type of product, and other factors. Other points covered include buying practices, inventories, and availability of freezer space. Careful examination of the data leaves no doubt that, while the survey period was for 4 weeks in January and February 1956, the results are pertinent to the current situation.

SSR-Fish. No. 346 - Species Composition of Industrial Trawl-Fish Landings in New England, 1958, by Robert L. Edwards and Lewis Lawday, 22 pp., illus., June 1960. Presents data on the species composition of the industrial trawl-fish catch landed in 1958 at the New England ports of Point Judith, R. I., and New Bedford and Gloucester, Mass. The information given covers percent by weight and pounds landed for each of the principal fishing areas, by month and port.

SSR-Fish. No. 349 - Chemical Analyses of Marine and Estuarine Waters Used by the Galveston Biological Laboratory, by Kenneth T. Marvin and others, 16 pp., June 1960.

Sep. No. 600 - Development and Use of Otter-Trawling Gear for Red Snapper Fishing in the Gulf of Mexico, June 1957-May 1959.

Sep. No. 601 - Structure of the Fishing Industry in the European Common Market.

(International North Pacific Fisheries Commission) United States Section Meeting, March 1960, Circular 85, 32 pp., illus., May 1960. Includes a brief discussion of the International North Pacific Fisheries Commission and its work. Also includes the following papers presented before a joint session of the Alaska Legislature on March 4, 1960: "Statement of the United States Section, International North Pacific Fisheries Commission," by Milton E. Brooding; Scientific Research by the United States," by J. L. McHugh; "Research Related to the Case for Abstinence," by R. A. Fredin; "Distribution and Racial Composition of Salmon on the High Seas," by Clinton E. Atkinson; and "Pacific Salmon in International Waters," by Allan C. Hartt.

Survey of Fishing in 1000 Ponds in 1959, by Willis King, Circular 86, 24 pp., illus., May 1960. Reports the results of a survey conducted to determine how much recreational fishing our national fish hatcheries are furnishing by providing warm-water fish to stock farm and ranch ponds. Findings show that one-fourth of all persons fishing in fresh water in 1959 fished at least once in a pond that had been stocked by the Bureau of Sport Fisheries and Wildlife. Between 30,000 and 40,000 ponds are stocked annually with fish produced at the national fish hatcheries. Large-mouth bass and bluegill sunfish were the primary species used in the stocking program while red-ear sunfish and bluegills were stocked in the southeastern States and channel catfish in 155 ponds in the southwest. More than 20 million man-days of recreational fishing were provided in 1959 to at least 5 million persons as a result of the farm-pond fish-stocking program, the survey showed.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-29	Union of South Africa Pilchard/Maasbanker Fish Meal and Oil Reduction Plants.
MNL-30	Venezuelan Reduction Plants.
MNL-31	Moroccan Reduction Plants.
MNL-32	Venezuelan Commercial Catch, Production of Processed Fishery Products, and Foreign Trade for 1958 and 1959.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore). Monthly Summary - Fishery Products, March and April 1960, 9 and 8 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, 400 E. Lombard St., Baltimore 2, Md.) Receipts at Baltimore by species and by states and provinces for fresh- and salt-water fish and shellfish; total receipts by species and comparisons with previous years; and wholesale prices on the Baltimore market; for the months indicated.

California Fishery Products Monthly Summary, Part I - Fishery Products Production and Market Data, July and August 1960; 14 and 15 pp., respectively. (Market News Service, U. S. Fish and Wildlife Service, Post Office Bldg., San Pedro, Calif.) California cannery receipts of tuna and tunalike fish, mackerel and anchovies; pack of canned tuna, mackerel, and anchovies; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California imports; canned fish and frozen shrimp prices; ex-vessel prices for cannery fish; for the months indicated.

(Chicago) Monthly Summary of (Chicago's) Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, August 1960, 13 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6 Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, August 1960, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for July 1960, 19 pp. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products; range of prices of fresh-water fish in Peck Slip, Jan.-July 1960; and marketing trends; for the month indicated.

Receipts and Prices of Fresh and Frozen Fishery Products at Chicago, 1959, by G. A. Albano, 65 pp., September 1960. (Available free from the Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) In the analysis of receipts of fishery products at Chicago, the author discusses the changes in receipts of various species from previous years. He also discusses sources of receipts; fishery products carload receipts at Chicago; trends in fishery products transportation; receipts by months, species, and varieties; and lake trout and whitefish fisheries and receipts. Other topics covered are trends in Great Lakes commercial fishery, imports of fresh and frozen fresh-water fish from Canada, imports of

selected frozen fishery products, cold-storage inventories, frozen shrimp market trends, U. S. shrimp landings and imports, and standards for grades of frozen raw headless shrimp. Also included is a table giving the names, classifications, and approximate weights of certain fishery products as used in the Chicago wholesale markets. The second section presents statistical data on fresh and frozen fishery products receipts at Chicago by species and by states and provinces of origin, states and provinces by species, species by months, states and provinces by months, totals by species, and totals by states and provinces. Receipts are tabulated by method of transportation (truck, express, and freight). A table shows the monthly range of wholesale prices of some of the leading varieties of fresh and frozen fishery products handled in the Chicago market.

Special Conference with the Fishing Industry on Export Trade Promotion, June 20, 1960, 14 pp., processed. (Branch of Foreign Fisheries and Trade, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, Washington 25, D. C.) A report on a special conference with the fishing industry on export trade promotion, held on June 20, 1960, in Washington, D. C. This report, consisting of summary minutes, lists the industry and Government representatives present and discusses the purpose of the meetings, foreign tariffs, quantitative restrictions, promotion of U. S. exports, and work of the Federal Trade Commission. It also covers assistance of the Export-Import Bank, duties of the Regional Fisheries Officer for Latin America, promotion of U. S. fishery products, and presentation of several fishery problems by industry representatives. A summary of fishing industry recommendations to increase U. S. exports is included.

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

"Use of a Small Otter Trawl to Sample Deep-Water Fishes in Maine Lakes," by Robert S. Rupp and Stuart E. DeRoche, article, *Progressive Fish-Culturist*, vol. 22, no. 3, July 1960, pp. 134-137, illus., processed, 25 cents.

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.

ANCHOVY:

"The Ripening Process of Anchovy," article, Redogorelse for Arbetsaret July 1, 1958-June 30, 1959, SIK Report No. 71, p. 36, printed in Swedish. Svenska Institute for Konserveringsforskning, Goteborg, Sweden, 1959.

ANTIBIOTICS

"Effectiveness of Dip in Iced Chlorotetracycline (CTC)-Containing Sea Water on Keeping Quality of Mackerel Aboard Ship and Determination of CTC Residues on the Fish," by Tetuo Tomiyama and Yasuo Yone, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 25, August 1959, pp. 290-293, illus.,

printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

ANTIBIOTICS:

"Questions of the Availability of Ice as Carrier of Chemical Preservatives--an Examination with Chlorotetracycline," by K. Higashi and others, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 24, no. 11, 1959, pp. 920-924, printed in Japanese with English summary. Japanese Society of Scientific Fisheries, Shiba-kaigandori 6-chome Tokyo, Japan.

ARGENTINA:

"La Pesca en la Republica Argentina" (The Fishery in Argentina), by A. B. Sailor, article, *Puntal*, vol. 7, no. 74, May 1960, pp. 11-12, illus., printed in Spanish. Puntal, Ramon y Cajal 3, Apartado 316, Alicante, Spain.

BIOCHEMISTRY:

"Sodium Content of Fish Flesh," by Claude E. Thurston and Kathryn L. Osterhag, article, *Journal of the American Dietetic Association*, vol. 36, March 1960, pp. 212-215, printed. American Dietetic Association, 620 N. Michigan Ave., Chicago 11, Ill.

CANADA:

Canadian Commercial Fish Landings of Eastern, Central, and Western Lake Erie, 1870-1958, by James W. Davies, 87 pp., illus., processed. Department of Lands and Forests, Parliament Buildings, Toronto 5, Canada. Production statistics taken from official records of the Canadian fishing industry in Lake Erie are presented by species, in tabular and graphical form for (a) Essex County, including the Pelee Island fishery; (b) Kent and Elgin Counties; and (c) Norfolk, Haldimand, and Welland Counties, including the Niagara River above the Falls, and including the Grand River from 1876 to 1904, and 1913 to 1922.

List of the Marine Fishes of Canada, by D. E. McAllister, *Bulletin No. 158*, National Museum of Canada, printed, C\$1.25 (about US\$1.29). Queen's Printer and Controller of Stationery, Ottawa, Canada. Includes all species of fishes recorded as occurring in the brackish and marine waters of Canada. In general, only fishes of the Continental Shelf and offshore fishing banks are listed. Names are listed alphabetically under the family or subfamily. The scientific name is followed by its author and date of publication.

Operations of Longliners and Dragners, Atlantic Seaboard, 1952-1958, by John Proskie, *Primary Industry Studies* no. 1, vol. 8, part 1, 110 pp., illus., processed. The Queen's Printer and Controller of Stationery, Ottawa, Canada, 1960. This is the first part of the eighth annual progress report on the study of modern fishing craft on the Atlantic seaboard. It reviews the impact of the modernization policy on the groundfish industry; strengths and weaknesses of the policy are appraised in terms of accomplishments to the end of 1958 and in terms of types and sizes of craft most suitable and successful in their operations. Trends established since the inception of the study are presented in chart form for the most important input-output factors affecting the profitability of the enterprises studies.

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

Also, tables are presented summarizing trends in average landings per enterprise by quantity and value of species as well as for the average prices received by fishermen.

Operations of Modern Longliners and Druggers, Atlantic Seaboard, 1958, by John Proskie, Primary Industry Studies no. 1, vol. 8, part 2, 68 pp., illus., processed. The Queen's Printer and Controller of Stationery, Ottawa, Canada, 1959. The second part of the eighth annual progress report on a study of the economics of modern fishing-craft operations in the Atlantic provinces. The tables provide a comparison of the findings obtained from the detailed accounts of 134 fishing enterprises for the 1958 season. The data include capital and operating costs, as well as returns to labor, capital, and management. The length of the fishing season and the intensity of the fishing effort are related to grounds worked, volume of output, and species landed.

Summary Statistics of Canada's Fisheries, 1939-1958, 39 pp., printed. (Reprinted from Canadian Fisheries Annual, 1960, pp. 60-98.) Canadian Fisheries Annual, Gardenvale, Quebec, Canada. Statistics are presented in 8 sections on landings and value of Canadian fisheries and related data: (1) summary statistics for 1949-1959; (2) East Coast fisheries; (3) fresh-water fisheries; (4) West Coast fisheries; (5) fillet production; and (6), (7) and (8) exports and imports. Also included are a list of addresses of fishing companies and a directory of fishery products by type, such as fresh and frozen fish (whole or dressed), fresh and frozen fish (filleted), smoked fish (dressed or filleted), cured fish, canned fish (not including shellfish), shellfish (in shell or meat--not canned), canned shellfish, fish oils and fish livers, fish meal, and other fishery products. Listed under each classification are the companies which process that particular product. Data are mostly for 1958, although some 1959 figures are given.

CANNING:

Canning, "article, Food Investigation 1957, pp. 20-21, printed. Department of Scientific and Industrial Research, London, England, 1958. (Available from Her Majesty's Stationery Office, York House, Kingsway, W. C. 2, England.) Describes studies for improving the quality of canned herring with regard to flavor and texture which are being carried out at the Torry Research Station, Aberdeen, Scotland, by the British Food Manufacturing Industries Association. The minor extractives that are largely responsible for odor and flavor in both raw and cooked herring meat are the subject of this study.

"Research on the Resistance of Tinplate to Corrosion," by S. C. Britton, article, Chemistry and Industry No. 7, February 13, 1960, pp. 158-163, printed. Chemistry and Industry, 14 Belgrave Square, London W1, England.

CARP:

Cultivo de la Carpa Seleccionada en Mexico (Selected Carp Culture in Mexico), by Fernando Obregon, 64 pp., illus., printed in Spanish. Secretario de Agricultura y Ganaderia, Calle de Tacuba 7, Mexico, D. F., Mexico, 1960.

CHESAPEAKE BAY:

Chesapeake Science, vol. 1, no. 1, April 1960, 77 pp., illus., printed, single copy 75 cents, annual subscription \$2. Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md. The first issue of a new publication devoted to presenting the results of research and management studies dealing with the natural resources of the Chesapeake Bay region and other technical papers on related subjects. The publications, issued periodically, proposes to publish short papers and notes. Participation is solicited by research centers, colleges, universities, and scientific societies in the Chesapeake Bay region. Includes, among others, the following articles: "Evaluation of a Method of Reducing the Powering Requirements of Soft-Shell Clam Dredging," by J. H. Manning and A. McIntosh Kennison; "Comparison of the Movements of Stocked and Resident Yellow Perch, *Perca flavescens*, in Tributaries of Chesapeake Bay, Maryland," by Romeo Mansueti; "Preliminary Report on Attracting Fish by Oyster-Shell Plantings in Chincoteague Bay, Maryland," by John Arve; "Supplemental Survey of Soft-Shell Clam Bottoms in Tidewater Somerset County, Maryland," by H. T. Pfitzenmeyer; "Notes on the Soft-Shell Turtle (*Trionyx*) in Maryland Waters," by Romeo Mansueti and David H. Wallace; "Mass Mortality of the Starfish, *Asterias forbesi*, on the Atlantic Coast of Maryland," by Fred W. Steling; and "Availability of Striped Bass during Summers of 1958 and 1959 as Reflected in Commercial Seine Catch," by George J. Murphy.

COD:

"Cod from Norway. II--Klipfish and Stockfish," by A. E. Hammond, article, Food, vol. 28, no. 334, 1959, pp. 256-258, illus., printed. Food, Tothill Press Ltd., 203 Tothill St., London S. W. 1, England.

COD FILLETS:

"The Effect of Time and Temperature of Cooking on the Palatability and Cooking Losses of Frozen Atlantic Codfish Fillets," by Iva L. Armstrong and others, article, Journal of the Fisheries Research Board of Canada, vol. 17, January 1960, pp. 1-7, printed. Journal of the Fisheries Research Board of Canada, Queen's Printer and Controller of Stationery, Ottawa, Canada.

CRUSTACEANS:

"Paper Chromatographic Studies on the Fatty Acid Composition of Some Fresh Water Crustaceans," by T. Farkas and S. Herodek, article, Acta Biologica Academiae Scientiarum Hungaricae, vol. 10, 1959, pp. 85-90, illus., printed. Acta Biologica Academiae Scientiarum Hungaricae, Magyar Tudomanyos Akademia, Akademia ut 2, Budapest V, Hungary.

FATTY ACIDS:

"Effects of Certain Pure Long-Chain Polyunsaturated Fatty Acid Esters on the Blood Lipides of Man. Use of Polyunsaturated Fatty Acids in Atherosclerosis," by H. E. Worme and L. W. Smith, article, The American Journal of the Medical Sciences, vol. 237, 1959, pp. 710-721, printed. The American Journal of the Medical Sciences, Lea and Febiger, Philadelphia 6, Pa.

FISH CAKE:

Food Hygienical Studies on Japanese Fish-Cake Products. I--The Rate of Penetration of Cooking Tem-

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perature in Fish-Cakes of Commerce, by Keishi Amano and others, 15 pp., illus., printed in Japanese with English abstract. (Reprinted from Bulletin of the Japanese Society of Scientific Fisheries, vol. 20, no. 9, January 1955, pp. 816-829.) Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

A Study on the Preservation of Fish Cake: Part III--Effect of Plastic Casing Upon the Storage of Sugar-Added Fish Cake, by Hitoshi Uchiyama, Keishi Amano, and Motonobu Yokoseki, vol. 21, no. 6, October 1955, pp. 441-447; Part IV--Factors Involved in Preservative Effect of Carbon Dioxide, by Motonobu Yokoseki, Hitoshi Uchiyama, and Keishi Amano, vol. 22, no. 1, May 1956, pp. 35-40; (Reprinted from Bulletin of the Japanese Society of Scientific Fisheries.) Both are printed in Japanese with English abstracts. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

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The Function and Significance of Fish Culture in Relation to the Regional/Village Economy, by R. Soekarno, Occasional Paper No. 59/77, processed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand, 1959.

FISH DETECTION:

"Fischsuche und Fischortung" (Location and Detection of Fish), by J. Scharf, article Protokolle zur Fischeretechnik, vol. 5, nos. 22/23, 1958, pp. 175-204, printed in German. Protokolle zur Fischeretechnik, Institut für Netz- und Materialforschung, Die Bundesanstalt für Fischerei, 72 Neuer Wall, Hamburg 36, W. Germany.

FISH FLOUR:

"Studies on the Nutritional Value of Defatted Fish Flour," by A. B. Morrison and J. A. Campbell, article, Federation Proceedings, vol. 19, Part I, March 1960, p. 326, printed. Federation of American Societies for Experimental Biology, 9650 Wisconsin Ave., NW, Washington 14, D. C.

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"Biological Evaluation of Factors Affecting the Protein Quality of Fish Meals," by N. T. Rand and others, article, Poultry Science, vol. 39, January 1960, pp. 45-53, printed. Poultry Science Association, Kansas State College, Manhattan, Kans.

"New Fish Meal Tested in Broiler Rations," by E. J. Day and J. E. Hill, article, Poultry Science, vol. 38, no. 5, 1959, pp. 556-559, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio.

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"On the Occurrence of Eicosatetraenoic, Docosapentaenoic and Docosahexaenoic Acids in Fish Oils," by Y. Toyama, Y. Iwata, and K. Fujimura, article, Fette-Seifen-Anstrichmittel, vol. 61, October 1959, p. 846, printed in German. Fette-Seifen-Anstrichmittel, Industrieverlag von Herhausen KG, Hamburg 11, Germany.

"Preparation of a Coating Material by Chlorination of Fish Oil. IV--Change of Molecular Weight of Fish Oil Caused by Chlorination," by Kosaku Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 12, 1959, pp. 1008-1011, illus., printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

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The Softening Deterioration of Fish Sausage:

Part I--Some Chemical and Microscopical Aspects, by Hitoshi Uchiyama and Takeo Tanada, vol. 24, no. 2, June 1958, pp. 148-155, illus.;

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Part III--An Anaerobic Starch Digestion by BACILLUS CIRCULANS Isolated from Softened Part of Fish Sausage and Other BACILLUS Species, by Hitoshi Uchiyama, Motonobu Yokoseki, and Koo-taro Motohashi, vol. 24, no. 5, September 1958, pp. 370-377, illus.;

Part IV--A New Preventive Means of the Softening Spoilage of Fish Sausage, by Hitoshi Uchiyama and Keishi Amano (Reprinted from Bulletin of Tokai Regional Fisheries Research Laboratory, no. 26, November 1959, pp. 61-67, illus.);

Part V--Effect of Sodium Pyrophosphate and Sorbic Acid on the Growth of Spore of BACILLUS CIRCULANS, by Hitoshi Uchiyama and Keishi Amano, vol. 25, nos. 7-9, November 1959, pp. 531-544, illus.;

(Parts I, II, III, and V reprinted from Bulletin of the Japanese Society of Scientific Fisheries.) All are printed in Japanese with English abstracts. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

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"Ensiling of Fisk og Fiskeaffald" (Ensilage of Fish and Fish Offal), by P. Hansen, article, Meddelelse Fiskeriministeriets Forsogslaboratorium, May 1959, 26 pp., illus., printed. Fiskeriministeriets Forsogslaboratorium, Ostervoldgade 10, Copenhagen-K, Denmark.

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Edible Protein Products from Fish Solubles, by Jeremiah Milner, U. S. Patent No. 2,857,278, October 21, 1958. U. S. Patent Office, Washington 25, D. C.

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Catalogue of FAO Fisheries Publications, August 1960, compiled by Patricia M. Andrews, 20 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. Lists periodicals, FAO Fisheries Studies, FAO Fisheries Papers, separate publications, and publications of the General Fisheries

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Council for the Mediterranean. Also lists publications of the Indo-Pacific Fisheries Council, reports of the Latin American Fisheries Training Centers, reports of the Expanded Technical Assistance Program, and reprints of articles appearing in FAO Fisheries Bulletin and other periodicals.

Soil and Water Conservation, vol. IV, Natural Aquatic Resources, 376 pp., printed in French and English. International Union for Conservation of Nature and Natural Resources, 31 rue Vautier, Brussels 4, Belgium, 1960. Contains papers presented at the Seventh Technical Meeting of I. U. C. N., Athens, September 1958, including those on basic elements--definition of soil and water conservation, definition of aquatic resources, and the uses of water and soils and the changes which man wishes to bring about in them. Papers also discuss the effect of land and water use on the aquatic environment--various soil conservation measures, engineering constructions; dredging operation, and pollution control; and the methods whereby deleterious effects of land and water use practices on aquatic resources can be minimized and, wherever possible, made to increase the resources.

The Use of Fishery Statistics by Government and Business in Northwest Europe, by G. M. Gerhardsen, FAO Fisheries Papers No. 17, 14 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, June 1960. Working paper presented at the Expert Meeting on Fishery Statistics in the North Atlantic Area, Edinburgh, Scotland, September 1959. Discusses the need for fishery statistics by Government and business; and available statistics on catch and landings, manpower, fishing craft and gear, processing establishments, and fish marketing. Also discusses international aspects of statistical systems; assessment of adequacy of statistics; and desirable trends in the development of fishery statistics.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These reports have not been published on a sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Fishery Resources of the Inland Waters (U. A. R. -- Northern Region), by W. C. Beckman, FAO Report No. 1045, processed, 1959.

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Marine Fishery Biology (Indonesia), by T. H. Butler, FAO Report No. 1057, processed, 1959.

Methodology and Techniques of Research on Mackerel (Thailand), by S. J. Holt, FAO Report No. 1095, processed, 1959.

Marine Fishery Resources (Philippines), by K. F. W. Tiews, FAO Report No. 1141, processed, 1959.

International Training Center on Handling and Processing of Fish (Thailand), by G. Sand, FAO Report No. 1164, processed, 1959.

The Kalaat el Mondik Experimental Fish Culture Station (U. A. R. -- Northern Region), by W. F. J. Wunder, FAO Report No. 1199, processed, 1960.

The Development of Fishing Harbours in the States of Bombay, Kerala and Madras, by Carl G. Bjuke and C. Ragnar Bjuke, FAO Report No. 1242, processed, 1960.

FOOD CONSUMPTION:

Food Consumption and Dietary Levels of Households Related to Employment of Homemaker, United States--by Region, Household Food Consumption Survey 1955, Report No. 15, 130 pp., illus., processed, 75 cents. U. S. Department of Agriculture, Washington, D. C., May 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This report contains a portion of the data from the U. S. Department of Agriculture's nationwide Survey of Household Food Consumption made in the spring of 1955. The survey was part of the Department's broad program of research on family dietary levels and the marketing and utilization of farm products. The survey was based on a national probability sample of approximately 6,000 housekeeping households of one or more persons. Data on "fish and shellfish" as a separate category are included in the tables.

FOOD POISONING:

"Studies on the Food Poisoning Associated with Putrefaction of Marine Products," by Toshiharu Kawabata and Shigeru Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, October 1959, pp. 473-480, illus., printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shibakaigandori 6-chome, Tokyo, Japan.

FREEZE-DRYING:

"Accelerated Freeze-Drying of Food," by S. W. F. Hanson, article, Food, vol. 28, no. 334, 1959, pp. 245-248, printed. Food, Tothill Press, Ltd., 33 Tothill St., London S. W. 1, England.

FUR SEALS:

"Atlantic Seal Hunt, 1960," by J. J. Quigley, article, Trade News, vol. 13, no. 1, July 1960, pp. 8-9, illus., processed. Information and Educational Service, Department of Fisheries, Ottawa, Canada. Describes the 1960 harvest of fur seals by Newfoundland, Nova Scotia, and Norwegian fleets in the Gulf of St. Lawrence and along Newfoundland's northern front. The Nova Scotia fleet took an estimated 80,000 pelts, valued at \$320,000. Despite innovations such as aerial spotting surveys, walkie-talkies, and power winches for loading pelts, however, the seal hunt is still a dangerous and strenuous operation and is today only a shadow of its former self.

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"Salmon and Steelhead in Idaho," by Ted C. Bjornn, article, *Idaho Wildlife Review*, vol. 13, no. 1, July-August 1960, pp. 6-11, illus., printed, Idaho Fish and Game Dept., 518 Front St., Boise, Idaho. Discusses briefly Idaho's commercial and sport fishery regulations; the spring, summer, and fall migrations of chinook salmon; the spawning runs of steelhead trout and sockeye salmon; and Idaho's contribution to Columbia River salmon and steelhead stocks.

INFESTATION:

"Effect of the Ingestion of *Tripanophorus* Plerocercoids on the Nutritional Characteristics of Whitefish Fillets in the Rations of Puppies," by E. W. Crampton, article, *Journal of the Fisheries Research Board of Canada*, vol. 17, January 1960, pp. 81-90, printed, *Journal of the Fisheries Research Board of Canada*, Queen's Printer and Controller of Stationery, Ottawa, Canada.

INTERNATIONAL BANK:

"Inter-American Development Bank--a New Venture in Regional Banking," by Larry F. Thomason, article, *Foreign Agriculture*, vol. 24, no. 8, August 1960, pp. 8-9, printed, Foreign Agricultural Service, U. S. Department of Agriculture, Washington, D.C. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D.C.) Discusses the background and functions of the Inter-American Development Bank, founded on January 1, 1960, with a membership including the United States and all Latin American Republics except Cuba. The broad objective of the Bank is to accelerate the general economic development of Latin America, with all Latin American countries sharing in the cost and in the responsibility for success.

IRRADIATION:

"Chemical Properties of Oils in Gamma-Radiation Fish Meat and Products. I," by Takashi Kaneda, Hisae Sakai, and Seinosuke Ishii, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 24, no. 11, 1959, pp. 909-919, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori, 6-chome, Tokyo, Japan.

Effects of Gamma Irradiation on the Quality and Storage of Fish, by Keishi Amano and Kinjiro Yamada, 12 pp., illus., printed in English with Japanese abstract. (Reprinted from *Bulletin of Tokai Regional Fisheries Research Laboratory*, no. 26, November 1959, pp. 51-59.) Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

"Irradiation Preservation of Pacific Northwest Fish. I--Cod Fillets," by David T. Miyauchi, article, *Food Technology*, vol. 14, no. 8, August 1960, pp. 379-382, printed, The Garrard Press, 510 North Hickory, Champaign, Ill. The specific objective of this study was to determine the effect of varying doses of ionizing radiation on the palatability and storage characteristics of raw fillets of Pacific cod held at refrigeration temperatures above freezing. Pacific cod fillets were irradiated at various dosage levels from 0 to 1.86 megarads to determine their initial acceptability and storage

characteristics at refrigerated temperatures (32° to 35° F.). The optimum irradiation dose for cod fillets appeared to be 0.46 megarads or lower. Irradiation at these low dosage levels increased the storage life of cod fillets at 32° to 35° F. by about three times. The objective freshness tests investigated, including determinations for total volatile base, total volatile acid, trimethylamine, and plate counts, did not appear to be a reliable index of quality.

"Precooked Fish Sticks," by David T. Miyauchi, *ibid.*, p. 411. In this study, the storage characteristics at room temperature of fish sticks irradiated at 1.0 and 2.0 megarads were poor. The storage life at 35° F. of irradiated fish sticks packed in cans was about 8 to 12 weeks, but the irradiated fish sticks were only fair in organoleptic quality throughout most of their storage life because a musty odor developed and the white meat darkened.

ISRAEL:

Fishermen's Bulletin, vol. 3, no. 4 (24), June 1960, 36 pp., illus., printed in Hebrew with English abstracts. *Fishermen's Bulletin*, P.O.B. 699, Haifa, Israel. Contains, among others, these articles: "The Red Sea--Its Importance to Research and Fisheries," by H. Steintz; "New Trawling Grounds in Deep Water," by M. Ben-Yami and A. Ben-Tuvia; and "Improvements on the Red Sea Trawl Fishery."

ITALY:

"En Italie Intervention de l'Etat dans le Developpement de la Peche Atlantique" (In Italy, Intervention of the State in the Development of the Atlantic Fishery), by Cesare de Felipe, article, *France Peche*, vol. 5, no. 42, July-August 1960, pp. 25-26, printed in French. *France Peche*, Tour Sud-Est, rue de Guemene, Lorient, France.

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Annual Report of Catch Statistics on Fishery and Aquaculture, 1958, Agriculture Forestry and Fishery Statistics Bulletin 34-40, 412 pp., printed in Japanese and English. Statistics and Survey Division, Ministry of Agriculture and Forestry, Tokyo, Japan, October 1959. Contains statistical information on the 1958 production of marine fisheries--whaling, pelagic fisheries on high seas, and domestic marine fisheries--whaling, pelagic fisheries on high seas, and domestic marine fisheries; culture in shallow seas, inland water fisheries; and culture in inland waters. Also presents data on processing, average market prices of fishery commodities, estimated value of catch, and consumption of petroleum products for fisheries.

An Attempt for Estimating Time of Dragnet Fishing from Freshness of the Catch, by Taneko Suzuki, 10 pp., illus., printed in Japanese with English abstract. (Reprinted from *Bulletin of Tokai Regional Fisheries Research Laboratory*, No. 26, November 1959, pp. 99-108.) Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

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Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan. Includes, among others, these articles: "On the Yearly Fluctuation in Availability of the Sardine, *Sardinops melanosticta*, Population Caught by Drift Net in the Western Part of the Japan Sea," by T. Doi; "Two-Boat-Purse Seine Fishery and the Age Composition of the Anchovy Catch in the Area Extending Between Kujukuri Hama and Kashima Nada, 1953 Through 1956," by S. Hayashi and K. Kon-do; "Effects of Gamma Irradiation on the Quality and Storage of Fish," by K. Amano and K. Yamada; "Studies on the Vitamin Oil Extraction. I--Loss of Vitamin A in the Alkali Digestion Method," by H. Higashi, T. Yamakawa, and Y. Shimoda; "Study on Alkali Digestion for Producing Vitamin Oil from Fish Livers," by H. Higashi, Y. Shimada, and H. Taguchi; and "An Attempt for Estimating Time of Dragnet Fishing from Freshness of the Catch," by T. Suzuki.

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Enhancing Effect of Starch on Jelly Strength of Fish Meat Jelly. II--Effect of Amylose and Amylopectin, by Minoru Okada and Atsuko Yamazaki, 8 pp., illus., printed in Japanese with English abstract. (Reprinted from Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, nos. 7 & 8, November 1957, pp. 476-482.) Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

Influence of Cooking Conditions on the Jelly Strength of Kamaboko, by Minoru Okada, 7 pp., illus., printed in Japanese with English abstract. (Reprinted from Bulletin of Tokai Regional Fisheries Research Laboratory, No. 24, June 1959, pp. 73-79.) Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.

Influence of Urea Upon the Binding of Some Ionic Dyes to Proteins, by Masao Migita and Shigeo Otake, 8 pp., illus., printed in Japanese with English abstract. (Reprinted from Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 8, December 1958, pp. 663-670.) Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

Utilization of Discarded Trawl Catches as Feed for Livestock, by H. Higashi and others, 26 pp., illus., printed in Japanese with English abstract. (Reprinted from Bulletin of Tokai Regional Fisheries Research Laboratory, no. 18, October 1957, pp. 47-72.) Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan.

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Fish Production and Consumption in West Java, by Rabbul Fahari, Occasional Paper No. 59/6, processed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand, 1959.

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"Second International Conference on the Law of the Sea," by J.P.A. Francois, article, United Nations Review, vol. 6, no. 12, June 1960, pp. 12-14, printed. International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.

MARINE ALGAE:

Economic Marine Algae of Tropical South and East Asia and Their Utilization, by J. S. Zaneveld, Special Publication No. 3, 55 pp., printed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand, 1955.

Journal of the Marine Biological Association of the United Kingdom, vol. 39, no. 2, June 1960, pp. 153-416, illus., printed, \$10.50. Journal of the Marine Biological Association, Cambridge University Press, 32 E. 57th St., New York 22, N. Y. Contains, among others, the following articles: "Studies on Marine Algae of the British Isles: the Genus *Ceramium*," by Peter S. Dixon; and "Studies on Marine Algae of the British Isles: *Ceramium shuttleworthianum* (Kütz.) Silva," by Peter S. Dixon.

MARINE BIOLOGY:

Marine Biology: Twentieth Annual Biology Colloquium, 1959, by Ivan Pratt and James E. McCauley, 96 pp., illus., printed, \$2.50. Oregon State College, Corvallis, Oreg., 1960.

MARINE CLIMATIC ATLAS:

U. S. Navy Marine Climatic Atlas of the World, vol. 1, North Atlantic Ocean, no. 17N, 275 pp., 1955, \$8; vol. 2, North Pacific Ocean, no. 18N, 275 pp., 1957, \$8; vol. 4, South Atlantic Ocean, no. 20N, 267 pp., 1958, \$8.50; and vol. 5, South Pacific Ocean, no. 21N, 267 pp., 1960, \$8. U. S. Navy, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Four volumes of a marine climatic atlas, presenting meteorological information for the surface and upper air over the oceans.

MENHADEN:

"Menhaden--Our Largest Commercial Catch," article Monthly Review, Federal Reserve Bank of Richmond, August 1960, pp. 2-5, illus., printed. Federal Reserve Bank of Richmond, Richmond, Va. Covers briefly the economic significance of the menhaden industry, the uses of menhaden products, method of landing, processing the catch, and problems and progress of the industry in recent years. Discusses the use of scouting planes for locating the schools, the use of the power block on the vessels, and the use of refrigeration.

MICRONESIA:

Fishes of the Marshall and Mariana Islands, vol. 2: Families from MULLIDAE through STROMATEIDAE, by Leonard P. Schultz and others, U. S. National

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Museum Bulletin 202, 438 pp., illus., printed, \$2.25. Smithsonian Institution, Washington, D. C. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

MILKFISH:

Synopsis of Biological Data on Milkfish CHANOS CHANOS (Forskål), by W. H. Schuster, Occasional Paper No. 59/73, processed. Indo-Pacific Fisheries Council, Food and Agriculture Organization of the United Nations, Bangkok, Thailand, 1959.

NEW ZEALAND:

Report of the Marine Department for the Year Ended 31 March 1960, 85 pp., printed. Marine Department, Wellington, New Zealand, 1960. Covers the activities and accomplishments of the Marine Department, including a report on fisheries for 1959. The latter discusses the quantity and value of spiny lobster and fish landings, fishing vessels, total landings at various ports, foreign trade in fishery products, and fish-liver oil production. It also discusses the whaling season, rock- and dredged-oyster landings, freshwater and marine fisheries research. Fishing Industry Advisory Council, and fishery legislation. All data are for the calendar year 1959.

NORTH AMERICA:

Fishes from the United States and Canada (second edition), by Reeve M. Bailey, 102 pp., printed, paper \$1. Librarian, American Fisheries Society, Colorado A. & M. College, Fort Collins, Colo. Revised and enlarged list of accepted common names, occurrence, and scientific names, fully indexed.

NORTH ATLANTIC:

"Perspektivy Razvitiya Rybolovstva v Severnoi Atlantike" (Fishing Prospects in the North Atlantic), by I. I. Marti, article, Rybnoe Khoziaistvo, vol. 35, no. 4, 1959, pp. 3-8, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSR, Moscow, U.S.S.R.

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Vekstinger i Forekomsten av Forskjellige Fiskeslag pa Skagerakkysten (Fluctuations in the Abundance of Some Fishes on the Norwegian Skaggerak Coast), by Alf Dannevig, Fiskeridirektoratets Skrifter, Serie Fiskeri, vol. 4, no. 3, 29 pp., illus., printed in Norwegian with English summary. A/S John Griegs Boktrykkeri, Bergen, Norway, 1959.

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Under the Deep Oceans: Twentieth Century Voyages of Discovery, by T. F. Gaskell, 240 pp., illus., printed, \$3.95. W. W. Norton & Co. 101 Fifth Ave., New York 3, N. Y.

PACKAGING:

"Quelques Aspects du Probleme de l'Emballage des Denrees Alimentaires Sterilisees par les Radiations Ionisantes" (Some Aspects of the Problem of Packaging Foodstuffs Sterilized by Ionizing Radiations), by L. Brunelet and P. Vidal, article, Revue Generale du Froid, vol. 35, no. 7, 1958, pp. 681-685, printed in French. Association Nationale des Ingenieurs et Techniciens du Froid et des Industries Connexes, 129 Boulevard St. Germain, Paris, France.

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"Polish Sea Fishing," by Andrezej Ropelewski, article, Studies and Monographs, Western and Northern Territories of Poland--Maritime Problems, April 1960, pp. 33-44, illus., printed. Department of Studies and Monographs, Nowy Swiat 27, Warsaw, Poland. Discusses the history of Polish marine fisheries and their expansion after World War I, losses to the fisheries during World War II, restoration and reconstruction, increases in annual catch since 1946, Government aid to the fisheries, and the present fisheries, and the present fishing fleet. Also covers the ownership of the fishing fleet, employment in the fisheries, training of fishing crews, fresh-water fisheries, consumption, and prospects of future development of Polish fisheries. Included are a number of tables and graphs showing fish catches, vessels, and consumption of fishery products.

PORTUGAL:

Boletim da Pesca, vol. 13, no. 67, June 1960, 134 pp., illus., printed in Portuguese. Gabinete de Estudos das Pescas, R. S. Bento, 644, 4^a-Esq., Lisbon, Portugal. Contains, among others, the following articles: "Consideracoes Sobre a Industria do Peixe Fresco na Metropole e em Angola" (Observations on the Fresh Fish Industry of Portugal and Angola), by C. Fernando Costa; and "Biologia Marinha no Grande Nordeste Brasileiro" (Marine Biology in the Area off Northeast Brazil), by Rui Simoes de Meneses.

"A Economia das Pescas em Portugal, a Industria de Conserva de Peixe" (Portuguese Fisheries Economics with Reference to Canned Fish), by Salviano Cruz, article, A Revista de Pesquisas Economico-Sociais, vol. 4, nos. 1-8, January-June 1955, 316 pp., plus 32 maps and charts, illus., printed in Portuguese. Estudos Economico-Sociais, Avenida Sidonio Pais, 4-5, 3-E, Lisbon, Portugal, 1958.

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Torry Research Station Annual Report 1959, Handling and Preservation of Fish, 36 pp., printed, 2s. 6d. (about 35 U. S. cents). Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland, 1960. Describes accomplishments in research during 1959 on improvement in quality of iced fish, freezing and cold storage, smoke curing, drying, canning, and fishery byproducts. Includes work on assessment of freshness of fish, preservative ices, jacketed cold stores, smoke deposition, "browning" of dehydrated and salted fish, reduction of free liquor in herring packs, fishmeal pilot plants, bacteriology of ice, fish muscle proteins, and many others.

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RADIOACTIVITY:

Study of Possible Relationship between Radioactivity and Toxicity in Fishes from Central Pacific, by Philip Helfrich, 18 pp., processed, 50 cents. Marine Biology Laboratory, University of Hawaii, Honolulu, Hawaii, May 1960.

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"Performance Test of the Refrigerating Plant of Moderate Size Trawlers," by A. Dobrovolskii, article Kholodil'naia Tekhnika, no. 3, 1960, pp. 24-28, illus., printed in Russian with short English summary. Kholodil'naia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

"Recommended Conditions for Cold Storage of Perishable Foodstuffs. III--Fish and Crustaceans: Chilled Storage," article, Bulletin of the International Institute of Refrigeration, Annex, 1959, pp. 46-49, printed in French and English. International Institute of Refrigeration, 177 Boulevard Malesherbes, Paris, France.

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"Biochemical Studies on Sockeye Salmon During Spawning Migration. IX--Fat, Protein, and Water in the Major Internal Organs and Cholesterol in the Liver and Gonads of the Standard Fish," by D. R. Idler and I. Bitners, article, Journal of the Fisheries Research Board of Canada, vol. 17, January 1960, pp. 113-122, printed. Queen's Printer and Controller of Stationery, Ottawa, Canada.

"Investigation and Management of Atlantic Salmon in 1959-60," articles, Trade News, vol. 12, no. 12, June 1960, pp. 3-16, illus., processed. Information and Educational Service, Department of Fisheries, Ottawa, Canada. "Part 1--The Research Programme," by C. J. Kerswill, covers availability of adult salmon, migrations and homing, production of young salmon, environmental changes, and behavior studies. Also included are several tables and charts depicting the commercial and sports fishery catches of salmon in eastern Canada in recent years. "Part 2--The Management Programme," discusses the salmon management effort in the Newfoundland, Quebec, and Maritime areas of eastern Canada. This includes projects such as studies on proposed hydro-electric development, stream improvement, stationary net licensing, construction of fishways, pollution control, and hatchery-spawning and rearing of young salmon.

The Salmon, by J. W. Jones, 206 pp., illus., printed. N. M. N. Collins, St. James Place, London, England, 1959.

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"The Factors Impeding and Accelerating the Process of Rusting of Salted Fish," by E. A. Mel'nikova,

article, Voprosy Pitaniya, vol. 17, no. 5, 1958, pp. 59-63, printed in Russian. Voprosy Pitaniya, Gosudarstvennoe Izdatel'stvo Meditsinskoi Literatury, Moscow, U.S.S.R.

"The Preservation of Salted Fish and Packaging with Polyethylene," by R. Lafont, article, Indo-Pacific Fisheries Council Proceedings, 6th Session, 1955, p. 287, printed in French. Indo-Pacific Fisheries Council Secretariat, Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Bangkok, Thailand, 1956.

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"Our North Sea Dilemma--The Sand Eel Story--Part I," article, World Fishing, vol. 9, no. 7, July 1960, pp. 30-32, illus., printed. John Trundell (Publishers), Ltd., St. Richards House, Eversholt St., London NW1, England. A discussion, in the form of questions and answers, of the characteristics of the sand eel or sand launce, their location and distribution, life cycle and feeding habits, natural enemies, method of landing, nations engaged in the fishery, volume of annual catch, and catching season. A forthcoming article will discuss the future outlook of the sand eel fishery.

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"Plant Sanitation in Frozen Foods--A Management Attitude," by Albert W. Emery, article, Quick Frozen Foods, vol. 22, February 1960, pp. 40-41, 156, printed. Quick Frozen Foods, E. W. Williams Publications, Inc., 82 Wall St., New York 5, N. Y.

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Chemical Studies on Seaweeds. I--Chemical Constituents of "Asakusanori" of Various Sources, by Takeshige Yamakawa, 5 pp., illus., printed in Japanese with English abstract. (Reprinted from Bulletin of the Japanese Society of Scientific Fisheries, vol. 18, no. 10, 1953, pp. 478-482.) Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

"Dulse Harvest," by G. J. Gillespie, article, Trade News, vol. 13, no. 1, July 1960, pp. 6-7, illus., processed. Information and Educational Service, Department of Fisheries, Ottawa, Canada. Describes the harvest of dulse, a seaweed, from the shores of Dark Harbour, Grand Manan Island, at the mouth of the Bay of Fundy. Gathered from the rocks along the lagoon's shoreline, the dulse is spread to dry in the sun, rolled up like a carpet, and then packed in bags for shipping to distributors. This seaweed is high in

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protein and mineral content and brings as much as 43 cents a pound, helping to bolster the economy of the island.

SHRIMP:

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Report of the Fisheries Division 1958, 29 pp., printed. Fisheries Division, Ministry of Commerce and Industry, Singapore. Reviews the achievements of the Fisheries Division during 1958 and discusses development of brackish-water shrimp ponds, the fisheries loan fund, the fisheries mobile unit, the apprenticeship training scheme, and the prospects for a trawl fishing industry. Also covers an inventory of the industry--manpower, licensed fishing boats, and gear, and pond cultivation of fish; fresh fish supplies--gross landings, local production, and imports and exports of fresh fish; fresh fish prices; trade in dried salt fish and other marine products; and cost of fishing material. A large portion of the report is devoted to statistical tables showing number of fishermen, licensed vessels and gear, fresh fish supplies, foreign trade in fishery products, and other pertinent data.

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Providing Capital for Your Firm, by Nathaniel C. Berkowitz, Management Aids for Small Manufacturers No. 115, 4 pp., printed. Small Business Administration, Washington 25, D. C., June 1960. Suggestions on providing capital for a small business are outlined in this leaflet. A firm's need for cash may suddenly be critical. Without it, a company may lose an opportunity or head for serious trouble. So it is vital that management be aware of sources of funds. Some of the things to be considered in looking for capital are: streamlining internal operations, tightening up trade relationships, selling excess assets, factoring (selling accounts receivable), borrowing from financing organizations, and taking a partner or selling stock. A list of references is included.

SOFT-SHELL CLAM:

A Partial Bibliography of the Soft Shell Clam, MYA ARENARIA L., by Hayes T. Pfitzenmeyer and Carl N. Shuster, Jr., Contribution No. 123, 29 pp., illus., printed. Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md. January 1960. In recent years a serious decline in the production of the soft-shell clam in New England and the establishment of a fishery in the State of Maryland have created a need for more concentrated scientific study of this species. As an aid to biological research, these literature citations were compiled as a preliminary step to a more complete annotated bibliography.

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"La Pesca de la Gamba y de la Langosta" (The Shrimp and Spiny Lobster Fisheries), by Miguel Masauti Oliver, article, *Puntal*, vol. 7, no. 75, June 1960, pp. 7-11, illus., printed in Spanish. *Puntal*, Apartado de Correos 316, Alicante, Spain.

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"Que Va Devenir le Marche de la Langouste?" (What is Going to Happen to the Spiny-Lobster Market?), article, *France Peche*, vol. 5, no. 42, July-August 1960, p. 35, printed in French. *France Peche*, Tour Sud-Est, rue de Guemene, Lorient, France.

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"Studies on Processing Squid Meat," by T. Takahashi and M. Takei, article, *Bulletin of Tokai Regional Fisheries Research Laboratory*, no. 14, September 1956, pp. 31-90, illus., printed in Japanese with English abstract. Tokai Regional Fisheries Research Laboratory, Tsukushima, Chuo-ku, Tokyo, Japan.

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STEELHEAD TROUT:

Scale Analysis of Steelhead Trout, *SALMO GAIIRDNERII GAIIRDNERII* Richardson, from Various Coastal Watersheds of Oregon (Thesis of John Morton Ball for the Master of Science Degree in Fisheries), 203 pp., illus., processed, not for general distribution. Department of Fish and Game Management, Oregon State College, Corvallis, Ore., July 1958.

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"Stickwater Vitamins," by J. S. Dunn, article, *South African Shipping News and Fishing Industry Review*, vol. 14, no. 6, 1959, pp. 64-65, printed. *South African Shipping News and Fishing Industry Review*, Odhams Press, S. Africa (Pty) Ltd., P. O. Box 2598, Cape Town, Union of South Africa.

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The Fishermen of Surinam, by Kalervo Oberg and Frank van Kijk, 66 pp., illus., processed. Surinam-American Technical Cooperative Service, Paramaribo, Surinam, April 1960. Contains a general summary,

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of Surinam fisheries and then discusses in detail the industry in each of 6 areas--Paramaribo, Nickerie, Coppername Point, Matapica, Albina, and Coronie. The first part outlines the two major types of fishing--the older traditional system of inshore fisheries, in which the majority of the fishermen are engaged, and the very recent system of offshore fisheries in which modern trawlers are engaged. Emphasis is placed on kinds of gear used, the methods of fishing, the living conditions of the people, and the values and interests which motivate the fishermen. This report is intended to contribute towards the planning of a realistic extension program for fishermen. The aim of the fisheries development program is to double the annual catch of 4,000 tons by 1965. The report concludes with a number of tables showing the fishing grounds used in the traditional system of inshore fisheries, distribution of fishing operators by area and type of fishing, distribution of fishing operators by ethnic origin, and other pertinent data.

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Some Physical and Mechanical Factors Important in Reducing Delayed Mortality of Hatchery Reared Rainbow Trout (Thesis of Howard Franklin Horton for the Master of Science Degree in Fisheries), 60 pp., illus., processed, not for general distribution. Department of Fish and Game Management, Oregon State College, Corvallis, Oreg., May 1955.

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The South African Pilchard (*SARDINOPS OCELLATA*) and Maasbanker (*TRACHURUS TRACHURUS*), Hydrographical Environment and the Commercial Catches, 1950-57, by M.E.L. Buys, Division of Fisheries Investigational Report No. 37, 176 pp., illus., printed. (Reprinted from *Commerce & Industry*, July 1959.) The Government Printer, Pretoria, Union of South Africa, 1959.

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the landings and value of catches and disposal of landings during the winter, summer, and autumn seasons; composition and distribution of fleets in East Anglia; curing strength and production of cured herring; imports of fresh and frozen herring; disposal of the United Kingdom's total herring landings, excluding imports; and applications for grants and loans. The appendix consists of a summary of pertinent directions having seasonal effect which were issued during 1959. The report mentions the new International Fisheries Convention, signed by the United Kingdom early in 1959. This Convention will allow the introduction of such measures of conservation as may be agreed to be necessary to ensure that the internationally-exploited European herring fisheries are managed to the best advantage of all concerned.

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Seals and Scottish Fisheries, by Bennet B. Rae, Marine Research No. 2, 1960, 39 pp., illus., printed, 15s. 0d. (about US\$2.10). Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland, 1960. (Available from Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland.) A brief historical account is given from the passing of the Grey Seals Protection Act in 1914 to the present time. The numbers, distribution, and food of the common and grey seals are studied. Claims by fishermen of destruction to salmon fisheries are examined as well as the effect of seals on marine fisheries. The harmful effect on fish, particularly cod, by the spread of a larval, parasitic worm and its correlation with the occurrence of large seal populations is discussed. The case for the conservation of seals is reviewed and recommendations made for a reduction in seal stocks.

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"Estimation of the Biological Potency of Vitamin A Sources from Their Maleic Values," by Stanley R. Ames and Robert W. Lehman, article, *Journal of the Association of Official Agricultural Chemists*, vol. 43, February 1960, pp. 21-25, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington, D. C.

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Part I--Molecular Distillation of Modified Oil, by Hideo Higashi, Yaichiro Shimma, and Toyosuke Kinumaki, vol. 20, no. 4, August 1954, pp. 328-336, illus.;

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Studies on the Molecular Distillation of Whale Liver Oils: Part I, vol. 18, no. 11, 1953, pp. 645-650, illus.; Part II, vol. 18, no. 12, 1953, pp. 675-682, illus., by Takeshige Yamakawa and Takajiro Mori; and Part III, by Takeshige Yamakawa, Shoji Konosu, and Takajiro Mori, vol. 19, no. 3, 1953, pp. 155-158, illus. (Reprinted from Bulletin of the Japanese Society of Scientific Fisheries.) All printed in Japanese with English abstract. (Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Tokyo, Japan.

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International Whaling Statistics, no. XLIV, 52 pp., printed, kr. 2.00 (about 28 U. S. cents). The Committee for Whaling Statistics, Oslo, Norway, 1960. A report on the results of the Antarctic whaling season 1958/59. Includes statistical tables showing whaling in the Antarctic; results for the various countries; average size of whales caught; whales caught by species, sex, and size; and average production of oil per blue-whale unit. Also includes data on size of pregnant whale females caught; whale fetuses measured by species and groups of size; and whale fetuses measured by species and sex.

"Some Observations on the Development of Whaling and on Its Central Problem Today," by Frithjof Betnum, article, Norsk Hvalfangst-Tidende, vol. 49, no. 6, June 1960, pp. 245-256, 258, 261-262, 264-265, printed in Norwegian and English. Norsk Hvalfangst-Tidende, Sandefjord, Norway. The full text of a lecture on whaling delivered at Norway's University of Economics and Business Administration. The author discusses the history of international whaling in the Antarctic area, the extent of the area and its resources, and conservation of the stocks. He also discusses the adoption of the International Whaling Convention in 1946, operations of the Antarctic whaling industry under the Convention, negotiations towards quota restrictions, results of the 1959/60 season, and the economic importance of the Norwegian whaling industry.



NEW SHRIMP PRODUCT ON MARKET

The shrimp industry now has available a moderate-priced product which can be used in a variety of dishes.

This product consists of pieces of shrimp meat which become available during the shrimp canning and breading process. A major part of the production of breaded shrimp in the United States is now packed under USDI continuous inspection. The tolerance for broken or pieces of shrimp which may be packed under the Grade A label is very low and this results in a supply of pieces which are sold at a price lower than that charged for unbroken shrimp tails.

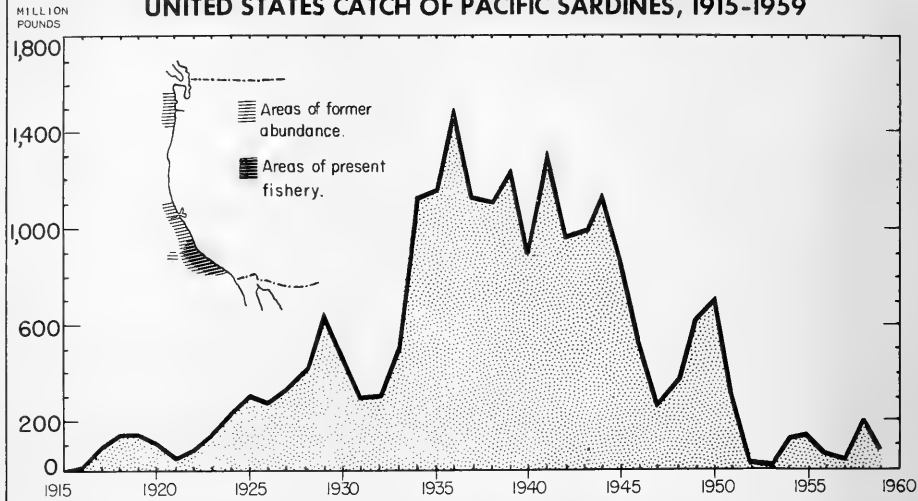
Since this is only a physical defect, it has no effect on freshness or wholesomeness. This is a situation analogous to the shelling of various types of nuts where the broken segments are sold at a lower price. It now becomes possible to use shrimp in low cost dishes especially in school lunches and other types of cafeteria meals for which formerly shrimp was too costly.

Bureau of Commercial Fisheries home economists and marketing specialists are now using this product in school-lunch and other fish-cookery demonstrations since the product is available nationally both canned and frozen.

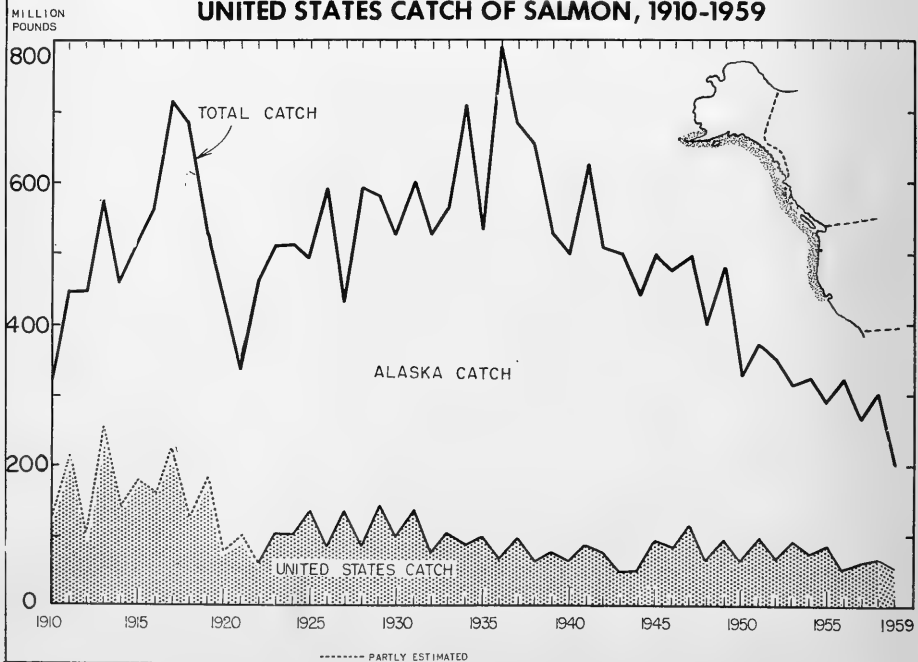




UNITED STATES CATCH OF PACIFIC SARDINES, 1915-1959

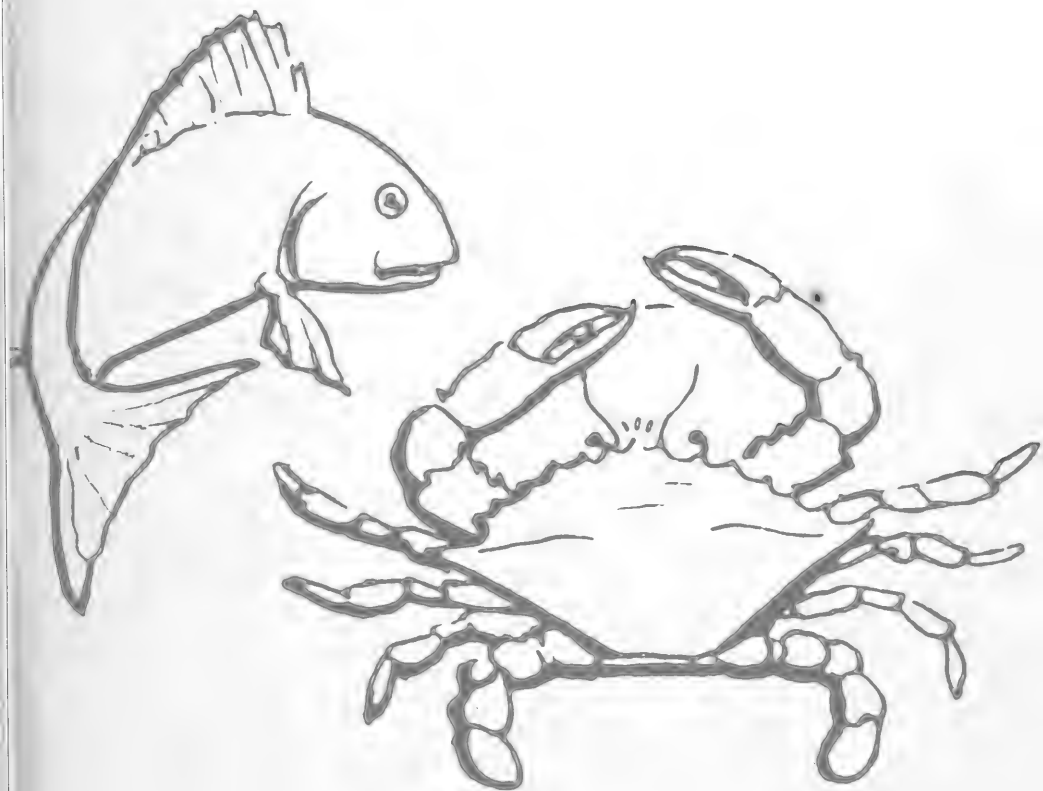


UNITED STATES CATCH OF SALMON, 1910-1959



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Fishes

COMMERCIAL FISHERIES *Review*



INDEX for 1960

• Volume 22 •

Production Manager
and Associate Editor: Jean Zalevsky

Editorial Assistants: Alma Greene,
Mary Andrews and Mary Donaldson

Composer: Judy Denler

An index of Volume 22, Numbers 1 through 12, issued in 1960. It is a subject index, with an author index for only the feature articles in each monthly issue. Indexing of other material is based on the principal subject with some cross-reference. The use of "_____" in entries denotes the omission (repetition) of the major subject heading which appears in ALL CAPS.

Actions in Congress affecting or of interest to commercial fisheries are indexed only once by subject under the general heading: "CONGRESS, EIGHTY-SIXTH (Second Session)," i.e., there is no cross-reference indexing of those entries.

Publications listed in the "Recent Fishery Publications" section have not been indexed.

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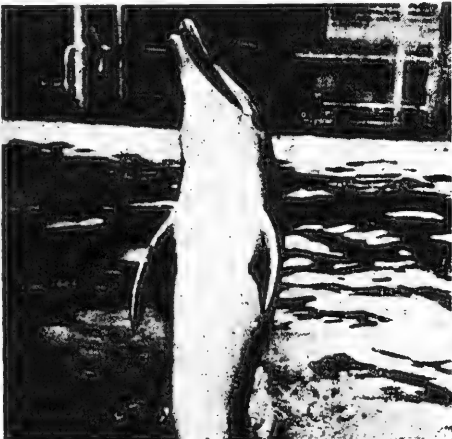
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DOLPHIN RATED TO BE ACCURATE FISH FINDERS

The general belief that the dolphin and its smaller counterpart, the porpoise, are friendly, intelligent, and harmless is not shared by some fishermen who blame them for destroying and damaging their nets, and chasing away schools of fish.

Marine scientists rate dolphin and porpoise as highly intelligent creatures. Tests have been made that seem to put the dolphin's intelligence on a par with man's. It is pointed out that dolphin learn more rapidly than man, and that they have a proportionately larger brain than man. And also that this brain is highly convoluted or full of wrinkles and folds; a quality which physiological psychologists say is related to intelligence.



A dolphin, which most Australians call a porpoise, leaps high to take food tossed to it in a marineland at Tweed Heads, on the N. S. W. -Queensland border.

ities. He theorizes that the dolphin generates his probing sound pulses deep inside his head and that the sound is led by a sort of cartilage wave guide to a dish-shaped bone in the upper part of the dolphin's head. The dish-shaped bone acts like a reflector and the fatty covering tissue called the melon acts like a lens for sound waves directing and focusing them in a sharp beam towards the target. The ears of a dolphin are widely separated and this binaural hearing greatly improves his directional sense. In this respect the dolphin has got it way over the average mechanical fish finder.

Another advantage the dolphin has is his variable rep rate. When he's near his target he sounds on it more rapidly and thus gets more precise information about it. There is some reason to believe that the fish-detecting machine of the dolphin is so perfected that its entire operation is automatic, that each returning echo triggers the next outgoing noise burst, and that the dolphin is virtually unaware of it happening--much as the iris of your eye adjusts itself to cope with different strengths of light.

It is surprising indeed how closely man has imitated the dolphin in his modern fish finders without realizing that the dolphin had beaten him by millions of years. (Australian Fisheries Newsletter)

Another thing that has been observed is that dolphins seem to talk to each other. Every fisherman knows how playful they are and how they are always surrounded by a number of their own kind. If you were to go skin diving among dolphin or porpoise you would hear a collection of odd squeals, burps, and clicks.

A scientist of the Woods Hole Oceanographic Institute has studied the voice of the porpoise as intensively as any man. He has made hundreds of recordings of dolphin sounds and analyzed them in many ways. One of his most interesting discoveries is the way a dolphin finds fish by sound waves. When a dolphin is fishing he sends out a series of clicks separated by a second or two. The instant the dolphin detects a fish his click rate increases and as he closes in on his victim, his rep rate speeds up in inverse proportion to the distance between himself and his prey. Just before the dolphin clamps his jaws on the fish his sonar signal reaches the pitch of a high buzz--almost a squeak.

According to the scientist, the dolphin's sonar has remarkably accurate directional qualities.

Created in 1849, the Department of the Interior—America's Department of Natural Resources—is concerned with the management, conservation, and development of the Nation's water, fish, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.



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COMMERCIAL FISHERIES REVIEW



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United States Department of the Interior
Washington, D.C.





COMMERCIAL FISHERIES REVIEW



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

Joseph Pileggi, Editor
H. M. Bearse, Assistant Editor

Mailed free to members of the fishery and allied industries. Address correspondence and requests to the: Chief, Branch of Market News, Bureau of Commercial Fisheries, U. S. Department of the Interior, Washington 25, D. C.

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5/31/63

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SALMON CANNED FIRST IN SCOTLAND

"One of our most important fish-canning industries, namely salmon, had its beginning during the Civil War period. Salmon is said to have been canned first in Aberdeen, Scotland, in 1824 and it is claimed that the first salmon canned on the American continent was packed at St. Johns, N. B., in 1839 and in Maine shortly after this time. However, it was never packed on an extensive scale as were lobster and oysters. . . The industry had its real beginning in California, first became important on the Columbia River and reached full development when salmon canning spread to British Columbia, Alaska, northern Japan and Siberia in order named." (Principles and Methods in the Canning of Fishery Products, Research Report No. 7, page 2, U. S. Fish and Wildlife Service.)

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* * * * *

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OBSERVATIONS OF RUSSIA'S FAR EASTERN FISHERIES ACTIVITIES

By Charles Butler*

BACKGROUND

The purpose of the visit of the United States delegation to the Far East of the U. S. S. R. was to observe the fisheries and to obtain samples of salmon of known history from Russian sources for the studies under way at the U. S. Bureau of Commercial Fisheries Seattle Biological Laboratory. The studies are related to the high-seas fishing problems of the North Pacific Salmon Commission's activities.

The United States delegation was made up of Clarence Pautzke, of the Washington State Department of Fisheries, an expert on fish hatcheries; W. C. Arnold, of the Canned Salmon Industry; Wm. Barlow, interpreter; Clinton Atkinson, in charge of the Bureau's biological research laboratory in Seattle, Wash.; and Charles Butler, head of the delegation, from the Bureau's Division of Industrial Research, Washington, D. C.

The delegation left Washington, D. C., on August 20, 1959, and arrived in Moscow, via Paris, on August 22. We conferred with the full Soviet State Scientific Committee (sponsors of our visit) regarding details of the projected trip and other fishery matters of mutual interest. After a tour of the permanent Moscow exhibit of Science and Agriculture, we left that evening for the Russian Far East. On the evening of August 23 we arrived at Khabarovsk, having been delayed en route (at Omsk and Irkutsk) by bad weather. After the welcoming banquet, we met the additional members of the Russian party with whom we were to travel.

Early on August 24, 1959, we left Khabarovsk aboard a two-engine propeller plane. The flight was approximately north, along the Amur River Valley, then across the Sea of Okhotsk to the village of Okhotsk.

VISIT TO THE OKHOTSK FISHING COMBINE

A welcoming party, including the Director of fishing activities of the area, escorted us to a nearby house for a breakfast banquet and discussion session. We then went by bus and ferry to the nearby fishing combine headquarters, some two miles from Okhotsk.

This combine was largely inactive as the salmon season was over. We visited the saltery facilities, the principal source of fishery products. No canning is done there. Salmon and herring are salted during a season of about five months. Fixed gear (traps) is used for salmon fishing along the ocean front. Salmon processed annually totals about 1,300 tons, half chum, half pink. The recent decline in salmon catches was blamed on Japanese high-seas fishing activities.

There is no harbor or in-shore moorage. Vessels anchor offshore and lighter cargo to and from shore. There was little evidence of other means of livelihood except fishing. The

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Note: Also see Commercial Fisheries Review, December 1959 p. 71, October 1959 p. 39.

combine operates its own coopeage shop, making tierces and boxes for salt salmon and her-ring, kegs for salmon caviar, and boxes for frozen fish (usually flatfish). The operation was on a rather large scale, with evidence of recent upgrading of buildings and equipment. Type of construction was planted poles for support members, hewn timbers for the structure proper, and rough-sawed lumber for roof and side walls. Floors were of concrete, with salting vats built into them. Good workmanship was evident despite primitive type of structures. There was some use of mechanical conveyors and flumes for mov-



Fig. 1 - Pump house on beach at Ohkotsk delivers salmon to plant.



Fig. 2 - Salmon are flumed to dressing plant, Ohkotsk Combine.



Fig. 3 - Close-up of fish conveyor, Ohkotsk combine.



Fig. 4 - Fish conveyor under construction, Ohkotsk Combine.



Fig. 5 - Reed mats hold fish under salt brine, Ohkotsk Combine.



Fig. 6 - Workers at fish saltry, Ohkotsk Combine.



Fig. 7 - Woman worker checking trimmed barrel, Ohkotsk Combine.

ing the fish. Plenty of labor was in evidence, with women apparently being used for many of the jobs.

The cold storage was a good one, except for the wood construction, with cork insulation. There must be considerable difficulty with frosting in the freezer and frozen storage areas. Most of the area we visited was for chilled storage of salted fish and salmon caviar.

REFRIGERATED CARRIERS PROVIDE OPERATIONAL BASE AROUND OHKOTSK SEA

Travel between the principal fishing ports around the rim of the Sea of Okhotsk and to the southward into the Sea of Japan was by refrigerated carrier vessel. We first went aboard such a vessel, the M/V Tuloma, on the evening of August 24 in the roadstead off the town of Okhotsk. This vessel, and a sistership, the M/V Kuloy, served as our floating home away from home for the better part of 18 days. They were most enjoyable bases of operations.



Fig. 8 - View aft from boat deck, M/V Tuloma.



Fig. 9 - View from bridge, showing bow of M/V Tuloma.



Fig. 10 - View of cargo winches and hatch, M/V Tuloma.



Fig. 11 - View of main deck showing cargo boom and winch, M/V Tuloma.

DESCRIPTION OF REFRIGERATED CARRIERS: There are five refrigerated carriers in the fleet that plies out of Nakhodka-Vladivostok to the many towns and villages, accessible only by this means for much of their inbound supplies and for outbound transport of products prepared for sale. Each vessel makes a swing around an assigned route once a month, including about one week of loading and unloading time at Nakhodka.

Total vessel complement is 58, with a Captain and 5 mates on deck, 5 mates in the engine room (one is a refrigeration engineer), and 3 women in the steward's department. Some of the women crew members did the purchasing of the food supplies for the ship, and others were responsible for checking cargo on and off the vessel.

The vessels have the usual navigational aids--radar, direction finder, radiotelephone and telegraph, visual and recording depth-sounders, fire-warning system, etc.

Refrigeration is by the compression system, with 4,500 cubic meters of refrigerated space. There are five cargo hatches. Main propulsion is by slow-speed Diesel, as are the electric generator auxiliaries. Deck winches and most other powered equipment are electric.

PLACE OF REFRIGERATED CARRIERS IN FISHING INDUSTRY: The season for hauling salmon is May to September. Balance of the year's cargo (inbound) is crab, herring, and flatfish. The cargo is consigned to cold-storage warehouses along the docks, usually at Nakhodka, but Vladivostok and Khabarovsk are alternative ports. Refrigerated trains take shipments, via the Trans-Siberian Railroad, to Moscow in 10 days. A mechanical refrigeration car is put on the line with 10 refrigerator cars on each end of it. Cold air is driven through these cars via connecting ducts. There were said to be individually-equipped mechanical refrigeration cars, but we saw in our visit to Nakhodka only the multiple-car type just described. Dry ice or salt-ice refrigeration was said to be used for shorter-distance shipments.

THE OCTOBER FISHING COMBINE

On August 28 we landed near Ust Bolsheretsk, at the southwest tip of the Kamchatka Peninsula, and conferred with the principal factors of the October Fish Combine. U. C. Kuznetzof, the Director, presided at a discussion of the combine's activities.

Canning was one of the principal activities, with chunk and pink salmon the predominant species taken. Recently those fish have been less abundant. Open-ocean fishing has had to be initiated for salmon, herring, cod, and flatfish to maintain the combine.

Present facilities include:

1. Cannery for salmon and "cambala" (flatfish).
2. Can factory.
3. Freezing and frozen storage plant.
4. Saltery, for salmon and herring.
5. Salmon caviar plant.
6. Floating vessel repair and machine shop.



Fig. 12 - Close-up of frame-construction house, October Fish Combine.



Fig. 13 - View of floating vessel repair shop, October Combine.



Fig. 14 - Fishing vessel hull repairs under way, October Combine.

Salmon fishing is conducted along the 35 kilometers of ocean beach assigned each combine. Fixed (floating) gear, not unlike the Alaska salmon trap, is used. In some instances, the heart or pot is disconnected and towed to the offshore floating pumping station and the fish are received at the cannery or saltery bins alive. In other instances, the trap is "brailed" by the crew of one small boat pulling the web into this boat, thereby working the fish into the opposite end at which a second boat is moored. The fish are transferred to the second boat and from there are taken to the factory for processing. At some times, during the season,

fishing for salmon is permitted with non-fixed gear in the river. We saw a haul- or beach-seining operation at one point (to supply us with live fish for blood samples). A fisherman, engaged in some form of gill-net operation, was also observed along the river bank. The latter activity was said to be "for personal use."

SALMON CANNING PROCEDURES:

The canning operation here annually resulted in 34,500 cases (48 1-lb. cans) of salmon. Species are not segregated in their pack reports. Silver salmon is now the dominant species whereas pink salmon was formerly the major variety.

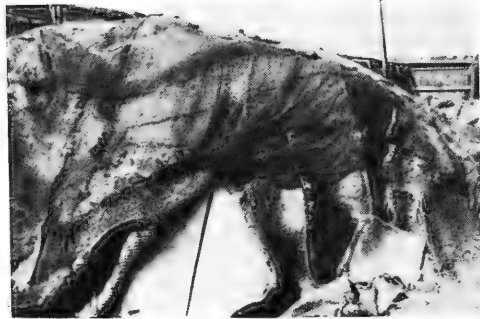


Fig. 15 - Natural ice storage pit. October Combine.



Fig. 16 - Ice-crusher, in storage pit, October Combine.



Fig. 17 - Crew working "fixed-gear" for salmon, October Combine.



Fig. 18 - Netting has been hauled aboard and fishermen are "drying up" the "heart," October Combine.

The raw material is not weighed. An estimate is made, based on the "pud" (possibly a vestige of the premetric system period), a volume measure equal to 36 pounds. Once the product is packed, the case count is used. Each regional



Fig. 19 - Fish-receiving skiff at "trap," October Combine.



Fig. 20 - Fish (salmon) coming aboard receiving skiff, October Combine.



Fig. 21 - Crew preparing to re-set the "heart" of the trap. October Combine.

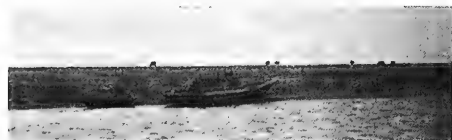


Fig. 22 - Fish barge at river bank near October Combine, Kamchatka.



Fig. 23 - Fish-delivery conveyor to processing plant, October Combine, Kamchatka.

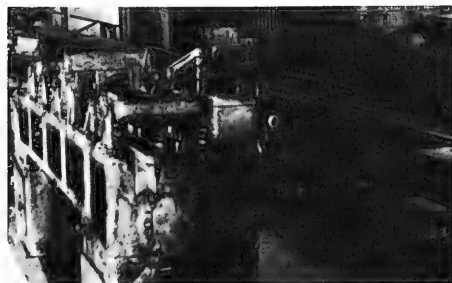


Fig. 24 - Salmon eviscerating machine, October Combine, Kamchatka.

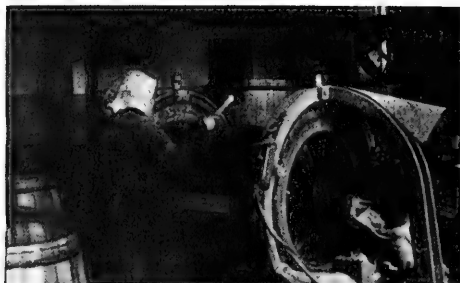


Fig. 25 - Woman worker operating barrel lathe, Ohkotsk Combine.

agency (the People's Economic Council) is responsible for reporting catch and product statistics to the Moscow headquarters. These reports appear in the Russian periodical "Fisheries Industries."

An important part of the Russian salmon-canning operation includes the removal of the roe by hand. Women workers, in "pits" past which the fish are chuted, slit the fish and remove the roe. The fish then go to "iron chinks" for butchering. Hand sliming is used. The fillers seen were Troyer-Fox or Jensen (vintage 1920's) probably installed by United States companies in the early 1930's. Balance of the canning equipment seen was comparable. A large amount of hand labor was evident, even for the slow-speed lines in use. Retort capacity seemed to be the limiting factor for glut processing.

CANNED FLATFISH IS IMPORTANT PRODUCT: Flatfish were being processed here, as elsewhere. The season of major production is October through December. This supplements the salmon and herring fisheries very nicely and extends the use of canning equipment. Four flatfish species are used for canning (or for freezing): (1) Limonda aspera; (2) Bilinata; (3) Pleuronectes quabrituberculatus; and (4) Limonda herzenstein (Jordah-Snyder). Approximately equal amounts of each of these are taken. Other species (of which we noted several), together with "trash" fish and the trimmings from the canning operation, go to the reduction plant. Alaska pollock is one of the species taken, but it is not considered suitable for canning or freezing.

Approximately 32,500 cases of 1-pound flats of cambala (flatfish) are canned annually at this combine. When a fishing vessel arrives with these species, the fish are pumped from the trawler's hold to shore pens for sorting. The selected species are then washed and the head, tail, fins, and the belly cavity area are sawed off in a band-saw operation. The waste joins the discarded fish en route to the fish-meal factory. Flatfish from frozen storage may also be used for canning.

PROCEDURE FOR CANNING FLATFISH: The trimmed portion is again washed, then cut (by a gang band-saw set-up) to fit the 1-pound flat when packed on edge. Breading is applied by hand. The breaded portions are next put in mesh baskets, immersed in a deep-fat-fryer vat for 3 minutes, then cooled for 1 to 2 hours.

Women next pack the portions into the cans. Spiced tomato sauce is ladled into the cans as they pass along the conveyor en route to the seaming machine. Retorting is standard. The product is quite acceptable to the Russian people, especially since this a relatively inexpensive form of permanently-preserved animal protein.

FREEZING FLATFISH: Flatfish are also frozen. The fish are placed two layers deep, by hand, in stainless steel pans about 18" x 30" x 3" high. Blast units maintained at -30° F. are used for fast-freezing. The frozen product is removed from the pans and stacked in frozen storage until shipped or used for canning. No glazing or other protection was observed. The canned flatfish was noted for sale in an inland town at 5 rubles per 1-pound flat, as compared to 11 rubles for 1-pound canned pink salmon (1 ruble equals US\$0.25).

The frozen flatfish and the better-quality mild-salted salmon are boxed for shipment to market. This salmon and the salmon caviar (in kegs of about 60 pounds each) are kept in refrigerated storage until offered for sale. One of the local cold-storage plants had an absorption-type ammonia system. It was considered quite satisfactory, and seemed to be well-designed and maintained. The operator-in-charge was a woman of about 25. Since the combine is chronically short of electric power, but can get, as "fuel" for the absorption system, the waste steam, the system seemed a "natural" for use under these circumstances.

A further canned product was "ragout" from the trimmings of the salmon-canning operation. Sometimes a ground sausage-like product was prepared from salmon trimmings, with seasonings added, then canned.

SALMON CAVIAR: The salmon caviar plant was principally notable for the attempt to be very sanitary. We waded through a pan of "antiseptic" solution before entering the screened plant. White smocks were passed out to each visitor. The processing was the standard hand sieving, brining, and oil-coating usual for salmon caviar. Several "qualities" were prepared, apparently based on species, egg size, and maturity. The final product was placed in kegs, each about 60 pounds net capacity, and held in chilled storage until shipped. It was difficult for us to make the Russians understand that United States practices do not include saving of roe for caviar. They consider this the most valuable product of the salmon fishery.

THERE'S "PROFIT" IN RUSSIA, TOO: Some semblance of the profit motive was observed in the operation of the combine. The fishermen are paid for the raw material. The combine, using this price as its prime cost, adds the processing cost and "a little for profit" and offers

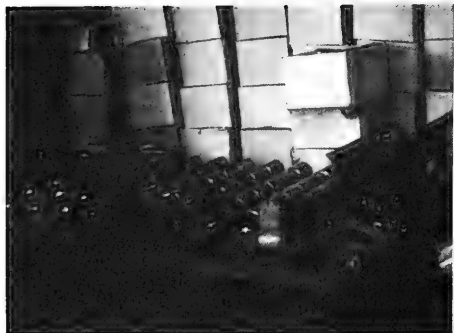


Fig. 26 - October Combine warehouse where filled and processed salmon cans are being outside-lacquered. Here they emerge from dip tank.



Fig. 27 - United States fisheries delegation studies fish-gear types, October Combine, Kamchatka.



Fig. 28 - Cold storage at October Combine as seen from the river.

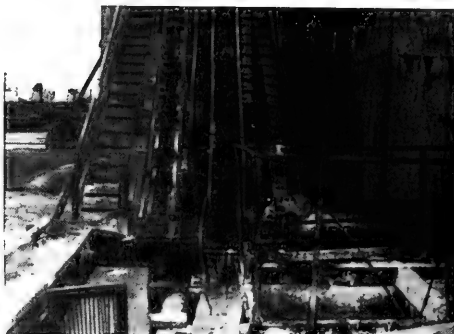


Fig. 29 - Conveyor from raw material pit to grinder in fish-meal plant, October Combine, Kamchatka.

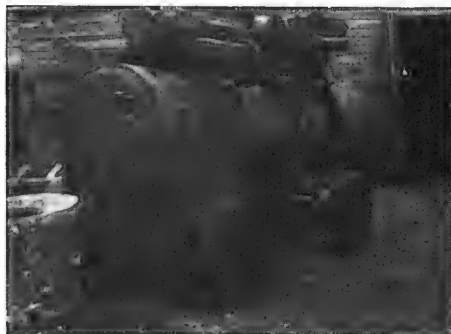


Fig. 30 - Portable coal-fired steam boiler used at October Combine fish-meal plant.



Fig. 31 - Raw material grinder, fish-meal plant, October Combine, Kamchatka.

the product for sale to the State distribution agency. The combine contracts to supply to the transport agency (in this case the refrigerated carrier vessel) a given quality and quantity of products. The carrier, in turn, contracts to pick up and deliver the agreed-upon shipments to railhead storage.

FISH MEAL FROM OFFAL: The reduction plant consisted of a coarse grinder for the raw material, small cooker-press unit, two-pass steam-jacketed dryer, vapor-suction equipment attached to the dryer, and grinding and bagging equipment. Capacity of the plant was about 2,000 tons of fish meal per year. Jute bags (100 pounds) were used. Quality of the meal was good. Since only flatfish raw material was used, there was no attempt made at (nor equipment available for) oil recovery. The meal was shipped into the more populous areas for use as poultry or swine feed supplement. Active interest was displayed as to markets for export of Russian fish meal to the United States. It may well be, as the Bering Sea trawl fishery and that along the Pacific Coast of Russia expands, the United States west coast may become a more economic market outlet than that via vessel carrier and railroad transport 3,000 to 5,000 miles to the west into European Russia. There was mention made of the use of urea as a feed



Fig. 32 - Fish waste destined for fish meal plant, October Combine.



Fig. 33 - Fish meal sacking and storage, October Combine. apparently based on: (1) quality, and (2) distance to market.

supplement in cattle nutrition, showing that knowledge of alternative supplements to animal protein sources is being disseminated.

SALT FISH PLANT: The saltery consisted of 16-cubic-meter vats of concrete, recessed into the earth. There were 360 of these vats; estimated capacity, 350 metric tons. Annual production consisted of 200 tons of salmon, 150 tons of herring. For salmon, medium-salted grade, a period of 6 to 7 days for salt-curing was necessary. Hard-salt salmon was processed for 14 days. Half-tierces, boxes, or reed sacks were used for packaging of the salted product,

VISIT TO THE FISHING VILLAGE AT OZERNAYA: The evening of August 31, the group went ashore from the Tuloma to the fishing combine at Ozernaya, some distance to the south, but on Kamchatka. Facilities were similar there except that, with a good supply of red salmon, the combine had prospered and had, apparently, put back into the town some of the profits of the fishery. The cannery consisted of two lines of the same style equipment as previously mentioned, including exhaust boxes, but with 4 Japanese replicas of the Smith iron chink and two sliming lines. There were being installed two Japanese "high-speed" $\frac{1}{2}$ -pound salmon lines. Two Japanese copies of the Smith chink of newer vintage, said to process 120 fish per minute, were also being installed. The cannery was fairly well laid out for efficient production. The walls were tiled up about 5 feet from the floor, but the concrete floors were very rough and poorly-drained.

The fish were removed from the vessel holds by use of a large centrifugal pump, powered by an automobile engine (including the transmission). A second such engine supplied the tangential jet to "prime" the main pump. Capacity of the system was 30 tons per hour.

1/ CAN - Tokyo Seikan Kaisha, Ltd.

Flatfish are also canned as the product "cambala," described earlier in this report. Year-round canning of this product is conducted at a daily capacity of 300 cases (1-pound flats).

The large saltery's activities are primarily for processing of herring. Annual production is at a level of 12,000 tons of herring, with an additional 800 tons of line-caught cod. Salted fish are held in -7° to -6° C. (19.4° to 21.2° F.) cold-storage space.

Freezing activities are for flatfish, with the principal species utilized those listed elsewhere in this report. Production is at the annual rate of 800 tons of flatfish, plus 1,000 tons of line-caught cod. Temperature in the frozen storage rooms visited was -12° C. (10.4° F.). No glaze was evident on the piles of frozen fish seen.

A new cold-storage building, of punice block, was under construction. Capacity--for frozen storage only--was 2,000 tons.

FARM COMBINE COMPLEMENTS FISHING ACTIVITIES: This fishing combine also has, as an adjunct, a farm combine up the river valley a few miles. The advantages of supplementation of food supplies were evident in the dietary variety as contrasted to other Far Eastern localities visited. Natural grass hay was being cut from large areas of the level land; small herds of beef and milk cows were observed, as well as some swine. Some larger plots of vegetable crops were noted, in addition to the "personal" gardens in the town proper. Potatoes, cabbage, cucumbers, tomatoes, turnips or rutabagas, and onions were among the varieties noted.

This fishing combine had a population of 5,500, of which 3,000 were workers. Also, of the 5,500, about 4,000 were permanent residents; 1,500 were transient workers, largely from Central Asia. A sprinkling of North Koreans was evident here, as elsewhere, in the fishing villages visited.

PORT OF NEVELSK, SOUTHERN END OF SAHKALIN ISLAND

Our next stop was Nevelsk, on the West Coast of Sahkalin Island near the south end. We arrived in the roadstead off Nevelsk about 5:00 p.m. on September 7. The usual two tugs, with the principal fisheries officials of the area aboard to welcome us, ferried us ashore by 6:00 p.m. Nevelsk was the first city we had seen since departure from Khabarovsk. We were quartered in the local (trawler) fishing industry hostel, at which vessel crewmen put up during their free time ashore.

We were permitted little opportunity to wander about this town, possibly because of the tight schedule. The town was built along the coast, with a steep hillside only 2 or 3 blocks back from the waterfront. Trawling was the principal activity. We saw possibly 40 trawlers at sea nearby, and another 40 anchored closer inshore, but not fishing. No local fish-processing facilities were visited.

ANTONOVO RESEARCH LABORATORY: On September 8 we journeyed, by single-car Diesel-powered rail car, north along the west coast to the Sahkalin Island headquarters and research center of TINRO (Pacific Institute for Oceanographic and Marine Research) in the town called Antonovo. This laboratory is well-staffed, with 42 professional people out of a total complement of 99. Several types of research are conducted there, and at the four substations in the Sahkalin-Kurile Island area assigned to the Antonovo laboratory for supervision by the People's Economic Council. Leionidov, the Director, is also in charge of the technological research work under way.

Among the projects are:

(1) Hydrobiology

- (a) Plankton distribution in Tatar Straits, the Northern part of the Japan Sea, and the Southern part of the Ohkotsk Sea.

- (b) Seaweed research, especially on *Laminaria*, *Anfestia plicata*.
 - (c) King crab; and other shellfish, including scallops and shrimp.
- (2) Gear studies
- (a) Improvement in gill nets, purse seines, trawls, fixed nets, and drift nets.
- (3) Technology
- (a) Problems of salting and canning herring and salmon, and the recovery byproducts from them.
 - (b) Storage and transport of fresh fish. (They had found chilled sea water not much good after 5 days.
 - (c) Uses of seaweed.

SAHKALIN ISLAND HATCHERY: Next morning we drove, by auto, along the same route for about one hour, then turned inland to a hatchery installation. The facility was said to have been initially built by the Japanese about 1927. The Russians, since about 1951, had razed the disused facilities and begun a more extensive program. At the time of our visit the annual level of production was said to be about 26 million eggs; ultimate annual capacity sought--33 million. Fish are largely chums, with a few pinks, and some sima (a sixth member of *Oncorhynchus* family found on the Asiatic side of the Pacific). Outstanding accomplishments cited were mortalities down to 1.3 percent since new water-filtering facilities have been installed. They are able to keep chums for five months before releasing them.



Fig. 34 - Living quarters of salmon hatchery workers, Sahkalin Island.

The staff of the hatchery seemed quite capable. Eleven families were in residence. Much of the manpower utilized was young girls in two categories: 3 engineers in charge of the research and production direction; and groups of technicians (younger, less trained girls) assigned to the egg-picking and related manual chores.

NAKHODKA, THE PRINCIPAL WINDOW ON THE PACIFIC

The evening of September 9 we returned to the *Kuloy* and the vessel departed for Nakhodka (the port about 50 miles from Vladivostok), the only Russian Far East port open to foreign vessels. We arrived off Nakhodka about 10:00 a.m. on September 11. By noon we had tied up at a wharf, unloaded our belongings, and been taken to a hostel. After lunch in a nearby restaurant we were taken on an auto tour of the docks and warehouses and then to the principal points of interest around the town.

HARBOR AND WHARF FACILITIES: Nakhodka is only 10 years old. It has an excellent well-protected harbor, with inner bays available as anchorages. Ocean-going freighters and tankers were moored at the wharf on which were many railroad cranes for swinging cargo from ship to shore and vice versa. Several rail sidings paralleled the wharf front. Next to these were 3-, 4-, and 5-story warehouses, including dry stores and cold-storage installations. The cold storage shown us was modern and reasonably well-operated, except for the lack of packaging or other forms of protection for the many frozen products in storage. Hand labor was evident at all stages.

Nearby we were shown through a multistory warehouse building in which canned fish was stored. Samples of several species and products were opened for an impromptu taste-panel by the group of Russian and United States fishery experts. Some salmon, labeled in English, was said to be for Western European trade. Interest was expressed in the possibility of an export market for salmon in the United States.

TOUR OF PUBLIC BUILDINGS: Our tour next included a drive past various schools, public buildings, and residential areas (largely the garden-court type of apartments). Because of the rugged terrain, any building or road construction was difficult and expensive. Hills of solid rock must be cut down; the narrow, winding valleys filled. Nevertheless there was considerable construction activity for miles along the row of hills just back from the narrow strip of level land along the waterfront.

We were shown the entire inside of one of several houses of culture. This structure had been completed not over two years ago at a cost of about 1 million rubles (US\$250,000). It had a rather large well-equipped stage and seating capacity for possibly 1,000 people. A regular schedule of events is developed each year by the director, including orchestras, ballet, singers, lectures, etc. Other parts of the 3-story building were used for such purposes as: reading and reference library (adults and children), game rooms, child guidance and group activities, and meeting rooms for local people.

We also drove through areas of new apartment development and of individual residences further away from the downtown area. As everywhere we travelled in Russia, the principal problem was lack of any semblance of good roads, or even streets, except on main thoroughfares in the larger cities.

Highlight of our visit to Nakhodka was a dinner on September 11. After about 3 weeks in fishing villages and aboard ship we marveled at a well-decorated, spacious restaurant, complete with a 5-piece orchestra playing an excellent variety of dinner music. The food was of a quality to reflect credit on the management.

TRAIN TRIP TO KHABAROVSK: Our departure from Nakhodka, originally scheduled for early on the morning of September 12, was delayed by flood damage along the route of the spur from Vladivostok resulting from the heavy rains of a few days earlier. We went aboard first-class coaches of the Trans-Siberian train at 11:00 a.m. Facilities were comparable to our Pullman compartments. There were two lower and two upper berths athwartships, with a small work table near the window. As we had only two persons per compartment, it was quite a comfortable trip.

The country through which we passed was apparently quite fertile, wooded where wild, and sparsely populated. We were told that certain parts had been set aside as sanctuaries for the Siberian tiger. Wild boar were also reportedly present. Habitations were almost exclusively restricted to sporadic farm villages along the railroad. Some coal-mining activity was evident, especially on the southern end of the trip. Where the soil was in use, and judging from areas of natural hay, the area would be a productive one for agricultural support of Far Eastern needs; this is not to compare it with "the Virgin Lands," or the Ukraine, thousands of miles to the westward.

As we approached Khabarovsk, the towns were larger. Groups, transported from the towns, were observed harvesting crops (largely potatoes) from large fields, apparently as part of a State farm operation. Industrial support activities, observed in the environs, were principally impressive for the vast coal piles seen along sidings. Chemical, furniture, and other wood-working plants, and coal-powered electricity-generator plants, were among those noted.

KHABAROVSK, METROPOLIS OF THE FAR EAST: We arrived at Khabarovsk at 1:00 p.m. on September 13. Brief talks were held with the local TINRO officials regarding all our observations of Far East activities. Plans were agreed upon for the next day. Our hosts then treated us to the finals of the intercity "football" (soccer) league of the area. The newly-

completed stadium, on filled land along the bank of the Amur River, was impressive. Nearby a pavillion was being constructed. The crowd was enthusiastic; the soccer contest close. All, including the United States fisheries delegation, had a pleasant outing.

KHABAROVSK MANAGEMENT AND RESEARCH CENTERS: The next morning we went first to the headquarters of the suburban enforcement division of TINRO. In the afternoon we moved downtown to the TINRO headquarters for further discussions. The office operates as a branch of TINRO, with main headquarters at Vladivostok, under Dr. Panin. It is one of four such stations in the area. Total local professional personnel was 40, of which 34 had advanced degrees. There are three principal programs of research under way:

1. Salmon, including study of stocks, propagation, and hatchery production expansion.
2. Fresh-water fish biology; study of the resource and the stock.
3. Artificial pond culture for fresh-water fish.

We left Khabarovsk the morning of September 15 in a TU-104 jet and reached Moscow that evening.

MOSCOW RESEARCH CENTERS

In Moscow we conferred with the principals at the VNIRO (All-Union Institute for Oceanographic and Marine Research) headquarters about our trip, items of interest which we wished to follow up, and to discuss background on United States fishery activities of interest to that Institute's staff. My primary interest was in the technological, statistical, and economics areas. In addition to these general (group) discussions, sessions were held on September 16 and 17 with the appropriate staff specialists in these fields. A map was supplied us showing the VNIRO, TINRO, National Academy of Science, and University locations where fisheries (or related subjects) research is in progress. (See map p. 14.)

The total VNIRO staff at the Moscow headquarters now totals 2,500--about half scientists and half technicians; there are 200 Ph.D's. The areas of work include both theoretical and practical research. Projects are planned at the Institute, based on industry needs observed at the field level. Local (field) People's Economic Councils recommend the areas needing research. At present the finances, for approved programs, are supplied by the State. It is expected, soon, that the local units will supply part of the funds.

The statistical responsibilities are vested in the State Statistical Control Agency in Moscow. This group has all aspects of the economy as its responsibility, with the fishing industry a small part of the whole. There seem to be no standardized indices; for example, all flatfish are grouped, as are all salmon. Each combine sends information on daily catch to the Regional People's Economic Council head and to the Central Statistical Agency in Moscow. Other local groups, e.g., cooperatives, must also report, but they are a small part of the industry. The People's Economic Council reports on catch, manpower, vessels, gear, etc., but the detail, or accuracy, is not what the scientific personnel would like for research purposes.

Some concept of the pattern of the industry was obtained. It may be highly inaccurate and incomplete, but is set down as presented to us.

BIRD'S EYE VIEW OF RUSSIAN INDUSTRY AND CONSUMER PREFERENCES

Two systems are in use at the fishermen's level:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Co-op groups sell catch to processors, based on a contract price. | <ol style="list-style-type: none"> 2. State fishermen work on a salary basis and their catch goes to the processors. |
|--|---|

Once the fish is processed, the State processor offers it to the State trade organization for distribution to the State market centers. State-operated stores are the ultimate outlets for all the products. At each stage in this process, to the prime cost is added the handling or processing cost and "a little profit" in arriving at the asking price for the next stage. However, the final or retail price is said to have been fixed (and at a fairly constant figure in recent years) by the State. In time, as efficiency builds up, the fixed price is supposed to decline.

There are regional differences in price: these include three zones, based on distance from the source--Far East, Moscow, and remote areas. Most of the mild-cured salmon and herring is shipped to local centers where it may be smoked before sale. At nearer points frozen fish is used for smoking, or for sale.

Preference of the population, as told to us, was salt fish, canned fish, and frozen fish, in that order. Among the less-expensive and widely used products was "cambala"--breaded flatfish, fried, and canned in tomato sauce. Some preference was evident for fresh flatfish in areas to which it is accessible. Estimates of market patterns were:

- 60 percent of flatfish, frozen (part for later smoking)
- 30 percent of flatfish, canned (cambala)
- 10 percent of flatfish, fresh

Flatfish is mostly sold round, not filleted.

Herring is now, and was predicted to be, continually, a salted item of ready acceptance. Canned salmon is only recently becoming a more significant domestic item, perhaps as the standard of living is raised. Salt salmon is still dominant.

Over the long pull, we were advised, especially in Moscow, that fresh and frozen (and even packaged fish) was expected to gradually replace salt fish on the domestic market. Meanwhile interest was expressed in possible export opportunities for canned salmon, frozen flatfish, and fish meal.

OTHER ACTIVITIES IN MOSCOW

Among the other activities of note in Moscow was attendance at the evening performances of the ballet in the Bolshoi Theatre, and of the Russian Circus. Each was without peer, in my experience. We also visited the all-Russian Art Gallery, the Kremlin, and the GUM-State Department Store. Russian ideas of service to customers leave a lot to be desired, even by standards in the United States during the Christmas rush.

Our activities on September 19 consisted of a close-out session at the offices of the State Scientific Committee--our sponsor during the tour. The atmosphere of scientific interest--exhibited during the discussions with the Committee on our outbound visit--was maintained on this occasion. We got the impression that both sides considered such an exchange helpful and worth the considerable effort required to bring it about. I consider our trip constituted a most far-reaching and significant attempt of the U.S.S.R. to show full accord for furthering exchange of scientific personnel in the interest of joint benefit.

On the evening of September 20 we departed Moscow via Air France. Seldom in our experience were the simple comforts of the West so starkly evident as on this flight after so many days within the "Iron Curtain."



DOWN WITH REJECTS--UP WITH PROFITS

R. T. Whiteleather*

What is the U. S. Department of the Interior (USDI) Fishery Products Inspection Service and what does it mean to producers and processors? This is a voluntary inspection service which was founded to help the fishing industry and at the same time give the consumer high-quality fishery products. It is not a policing action! It is a program of assistance in quality control. Where defects in production processes are found, USDI inspectors try to assist by recommending corrective measures. Plant management voluntarily defrays the entire cost of the service. Only four years old, this program is still in the growing stage. Its early growth has been extremely gratifying because it demonstrates the confidence that the industry has placed in the Voluntary Federal Inspection Program. You may be a little surprised to know that the amount of frozen fishery products under USDI inspection in the United States is running well over 100 million pounds annually.

In the Gulf and South Atlantic Region specifically, about 47 million pounds of that 100 million pounds plus total are now made up of shrimp products carrying the USDI Inspection Shield. This includes nearly 80 percent of the breaded shrimp output in that area. Considering that breaded shrimp standards have been in effect barely two years, the quantity of shrimp now under inspection has reached an impressive record in volume. The number of shrimp-processing plants subscribing to the Inspection Service has also grown to 18.

All of this might well be called the shiny side of the inspection coin. Now let us turn it over and look at the other side which is a little less bright. Here, we find statistics on the amount of shrimp that has been thrown out of grade or rejected by USDI inspectors for various reasons. Some significant factors or trends have been revealed by an analysis of the weekly records on products rejected by USDI inspectors for the 12 months preceding June 1960. Remedial action would put some additional money into industry pocketbooks. Under today's competitive marketing conditions, everyone will no doubt endorse this idea.

To be exact, 379,112 pounds of shrimp and shrimp products were rejected or thrown out of grade during the 12 months (May 1959-April 1960) reviewed. Percentage-wise, this is not a large proportion of the total production; just about 1 percent. Dollar-wise, however, it could be a substantial amount, depending entirely on the method of disposal of the rejects.

*Assistant Regional Director, Region 2, U. S. Bureau of Commercial Fisheries, St. Petersburg Beach, Fla.

Note: Adapted from an address at the Shrimp Association of the Americas Annual Convention, Mexico City, June 25, 1960.

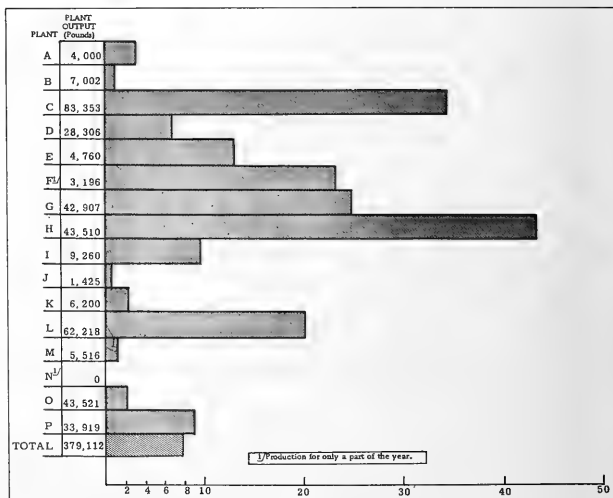


Fig. 1 - Rejection of shrimp at each plant under USDI Inspection, Gulf and South Atlantic, May 1959-April 1960.

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FISH AND WILDLIFE SERVICE
SEP. NO. 606

The actual amount of loss in dollars becomes a little cloudy at this point since a product rejected or denied a grade shield is not a total loss if sold out of grade. Products merely out of grade because of certain defects are often sold at lower prices. On the other hand, some rejects reached a condition beyond salability and, undoubtedly, were or should have been discarded entirely. We have no way of pinpointing the exact dollar values involved. However, it is safe to say that if all products intended for Grade A remained in grade, their value would be substantially higher than if sold at a lower grade because of rejection at the time of processing or packing.

In order to analyze the figures, the various reasons for rejection of products were broken down into these six categories:

- | | |
|----------------------------------|-------------------------------------|
| 1. Decomposition | 4. Excessive breadding |
| 2. Dehydration and deterioration | 5. Overloaded freezer or defrosting |
| 3. Low net weight | 6. Sanitation |

Decomposition for inspection purposes is defined as spoiled or unfit for food purposes. Dehydration is a condition of severe loss of moisture through mishandling. Deterioration is loss of quality, however, the product is well above the decomposition level and still suitable for human consumption. Low net weight means exactly that. Excessive breadding is the term

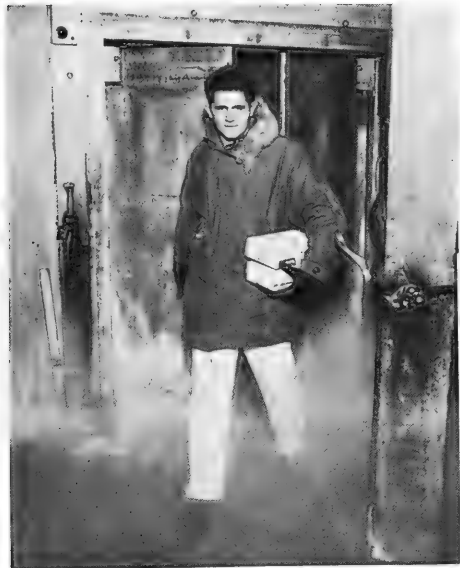


Fig. 2 - An integral part of a USDI inspector's duties--the drawing of official samples and checking blast-room temperatures.



Fig. 3 - USDI inspector examining contents of package to determine condition of breadding, excessive frost, and loose breadding within package.

used where breadding is in excess of 50 percent, including the 5 percent correction factor as permitted under the standards. Overloaded freezer means slow-freezing rate resulting in a poor-quality frozen product, and grouped with this is defrosting, a thawed-out product. Sanitation reflects the sanitary conditions of the product.

A further separation was made to show rejections by types, namely raw headless shrimp, peeled and deveined shrimp, and breaded shrimp.

The preponderance of the total pounds rejected stems from decomposition. Of the total of 379,112 pounds of processed shrimp rejected, 265,600 pounds were rejected because of decomposition. The rejections were mainly at the point of entry at the plant and show definitely that management had not been sufficiently cautious in purchasing shrimp for further processing. Perhaps some of this laxity can be attributed to the realization that raw products not up to quality can be resold or shunted off elsewhere. From any angle that you look at it, this is not a desirable practice and the frozen raw headless shrimp standards will furnish a device for correcting some of this situation. Under the new frozen standards, plant management will be able to buy domestically on U. S. Grade Standards or specify equivalents on foreign purchases. Compliance should reduce the reject figure materially and, at the same time, give management greater peace of mind about the quality of the materials entering the processing plants.



Fig. 4 - USDI inspector weighing debreaded shrimp to determine percentage of shrimp.



Fig. 5 - USDI inspector checking batter temperature to minimize bacterial growth.

Because of dehydration and deterioration, 79,022 pounds, representing 21 percent of the total were rejected. These two factors develop principally because of mishandling either at the boat level, in transporting, or during storage in the plant. Inspectors have constantly worked with management in recommending ways of reducing this figure. There are indications that the trend is moving downward, and the figures on these rejections should be substantially lower in the future.

Rejection for low net weight was very small--850 pounds. The important point here is that an inspector called attention to a faulty scale and incorrect weighing operation before much damage had been done. Alertness of the inspectors in instances such as this often saves management money. Short-weight charges are serious and costly.

Excessive breadening caused 21,900 pounds of the finished product to be thrown out of grade. This represents 6 percent of the total processed shrimp rejects. While many plants run close to the maximum breadening tolerance, some play the breadening percentage too closely

with resulting rejections for this reason. Inspectors keep a rather close check on breeding percentages during plant operations, and the inspector always intends to be helpful when advising management that the percentage of breeding is approaching the limit. In other words, he wants to see correction instead of rejection.

Some of the finished product goes out of grade because of freezer inadequacies--7,740 pounds, or 2 percent, were rejected because of overloaded freezer or defrosting. An overload in the freezer causes slow and improper freezing resulting in defects and a poor final product. Obviously, defrosting is damaging and, unless there is emergency, such as a freezer breakdown, most other factors can be controlled by proper handling and storing. Inspectors attempt to make suggestions for better techniques in this respect wherever improvements are indicated.

Finally, under sanitation there is only a single instance of rejection--4,000 pounds, or 1 percent. This is an isolated and rare case where insects had found their way into the breeding material. The product, of course, was completely unacceptable.

You might wonder if there is any pattern of distribution in the volume of rejects among shrimp-processing plants or if they are spread rather evenly throughout all plants under inspection. Figure 1 shows the percentage of rejects for the year as related to the individual output of 16 plants identified by code letters. It is readily apparent that the heavy burden of rejection falls on about five plants. The others seem to be consistently more observant of the requirements in meeting grade standards.



Fig. 6 - USDI inspector examining package coding for the purpose of identification.



THE FROZEN FOOD CODE AND THE RETAILER

The growth of the frozen food business will only continue if product quality and value are maintained. It is generally recognized that an extremely high percentage of frozen foods are of excellent quality when packed, but sufficient complaints from consumers are causing concern to the trade. The retailer is largely to blame; the greatest amount of abuse occurs at the retail level. In 1958 of 7,000 retail display cases checked, 30 percent were operating at temperatures above 5°F., 5 percent were from 16° to 25°F., and less than half had the desirable temperatures of 0°F. or lower.

The Frozen Food Retailers Code is in three main sections; definitions, equipment, and handling practices--each section has subsections. The code is comprehensive and covers all aspects from specifying a product temperature of 0°F. to the siting of the show case units, and the provision of backroom storage. In all, some 35 definitions and rules make up this code of practice. ("What the Retailer Must Know About the Frozen Food Code," article, Quick Frozen Foods, Oct. 1959, pp. 186-188.)



TRENDS AND DEVELOPMENTS

Fishing Vessel and Gear Developments

EQUIPMENT NOTE NO. 6--CHAIN BRIDLES AND ACCUMULATORS INCREASE EFFECTIVENESS OF "FALL RIVER" CLAM DREDGES IN DEEP WATER:

Exploratory fishing by State and Federal research agencies and members of the commercial fishing industry revealed the presence of hard clams (*Venus* sp.) in offshore waters of North Carolina. Several types of mechanical and hydraulic dredges have been used in the past ten years in attempts to produce commercial quantities of the clams, but these attempts have been unsuccessful owing to adverse sea conditions, deep water, and extremely soft mud bottom.



Fig. 1 - Commercial catch ($6\frac{1}{2}$ bushels) of hard clams (*Venus* sp.) taken by the *Silver Bay* off Beaufort, N. C., in 6 fathoms. The chain bridle and the accumulator can be seen.

In the fall of 1959, the U. S. Bureau of Commercial Fisheries' chartered exploratory fishing vessel *Silver Bay* was assigned

to part-time clam-dredging operations off the North Carolina coast with a 14-tooth "Fall River" dredge. Initial results were comparable to those obtained by previous investigators in the area. Through experimentation it was determined that the main cause of the poor catches lay in the inherent design and action of the dredge:

1. Efficient dredge operation could only be accomplished with an extremely small ratio of towing-warp length to water depth (warp-scope ratio), because increasing the ratio served only to tip the dredge forward, thereby reducing its catching efficiency (fig. 2, A and B). Efficient operation in deep water, where a large warp-scope ratio is necessary, was therefore precluded.

2. Even with a small warp-scope ratio, the dredge tended to skip or bounce over the surface of the sea bottom in rough seas, on uneven bottom, or when the vessel speed was excessive.

A series of gear studies, undertaken to correct the observed shortcomings of the dredge in deep-water operations, resulted in the adoption of the following modifications (fig. 2C) which increased the catch efficiency of the dredge:

1. The tow point was lowered from the original fixed position on the bail to change the angle of attack and to allow greater control over the angle of attack. This was accomplished by connecting two 9-foot chain slings to the bottom of the vertical steel stiffeners. The chains were shackled together at their forward ends to form a bridle. A third chain was run from the bail to the apex of the chain bridle for controlling the angle of attack. By lengthening or shortening this control chain, the dredge can be made to assume the angle of attack desired for any warp-scope ratio, including the large ratio needed for deep-water work. Determination

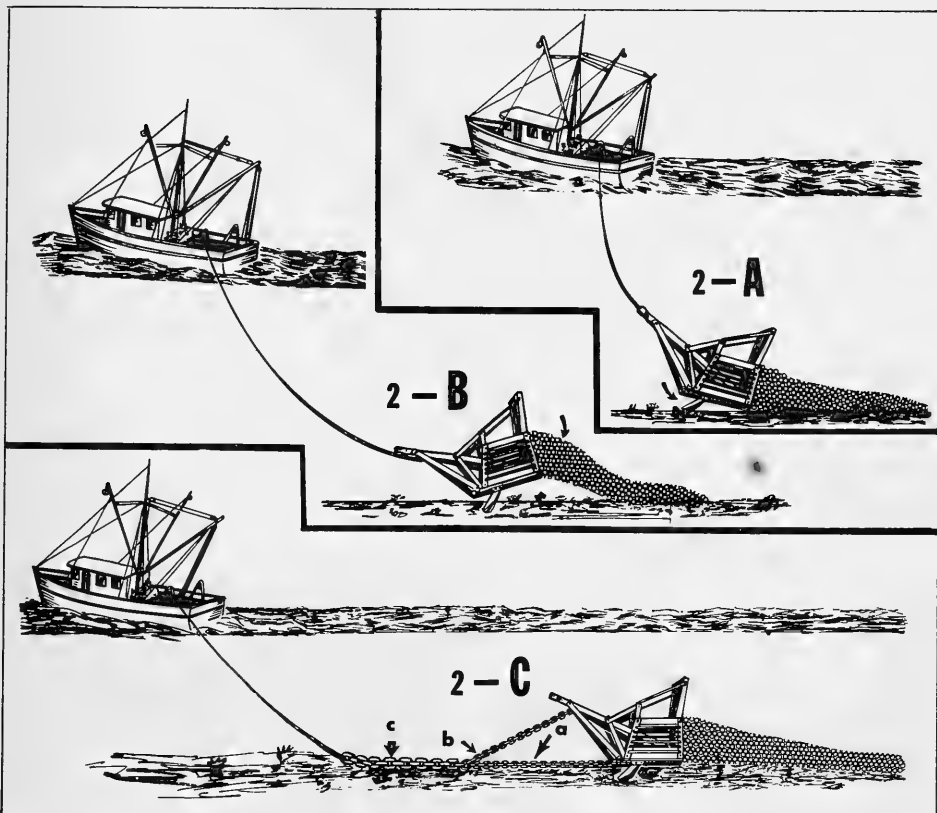


Fig. 2 - Dredge position in relation to the warp-scope ratio: **A.** Even with a short scope, efficient operation is often precluded because excessive ground speed or sudden surges from wave action cause the gear to skip out of the bottom. **B.** When the warp-scope ratio is increased, the dredge tips forward. Catching efficiency is thus impaired because of the reduced penetration of the teeth into the bottom. **C.** Gear modified by the addition of chain bridles (a), control chain (b), and accumulator chain (c) rides at the apparent optimum angle of attack.

of the desired angle of attack was accomplished by correlating the catch with observations of the condition of the runners and teeth of the dredge after each drag. Optimum efficiency is apparently attained when the dredge is on the bottom the full length of the runners.

2. To reduce the tendency of the dredge to skip out of the bottom, nylon towing warp was used in the place of wire, and catches greater than those obtained using wire warp resulted--especially in rough seas or when

working uneven bottom. The advantage obtained, however, was offset by the greater risk to the deck crew, excessive manpower requirements, and a more time-consuming operation.

3. A 5-fathom length of $\frac{3}{4}$ -inch-diameter chain was then attached between the end of the tow warp and the chain bridle of the dredge to act as an accumulator. This markedly reduced the skipping action of the dredge, thereby permitting a return to wire warp and resulting in a safer, more efficient operation.

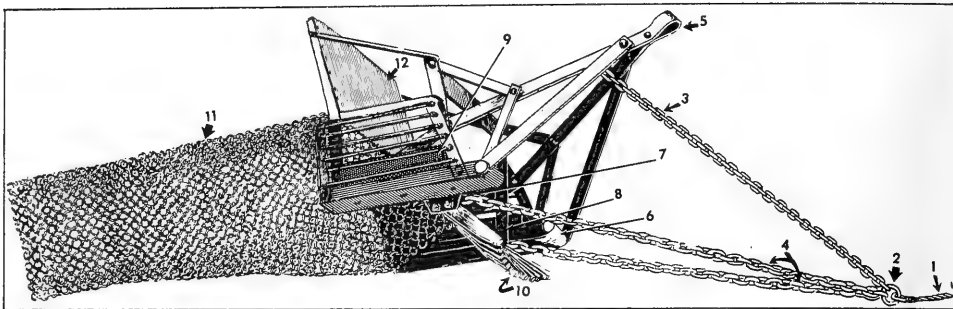


Fig. 3 - "Fall River" clam dredge with the chain towing bridle (accumulator not shown--see figs. 1 and 2): (1) Tow warp. (2) Tow ring. (3) Control chain (for changing the angle of attack of the dredge). (4) Chain bridle. (5) Bail. (6) Runner (shoe). (7) Chain bridle connection point (same on both sides). (8) Steel bar--vertical stiffener. (9) Lead weights (approximately 200 lbs. distributed on both sides). (10) Teeth (7-9 inches in length). (11) Chain bag constructed of $\frac{3}{4}$ -by 2-inch rings and $\frac{1}{8}$ -inch connectors. (12) Pressure plate.

Commercial-size catches, averaging 6 bushels of clams per 30-minute drag, were taken consistently with the modified "Fall River" dredge in areas where other types of gear averaged only 1 to 2 bushels in the same length of time.

--By Francis J. Captiva,
Fishery Methods and Equipment Specialist,
Branch of Exploratory Fishing,
Division of Industrial Research,
Pascagoula, Miss.

* * * * *

EQUIPMENT NOTE NO. 7--SPACE- SAVING CHART TABLE INSTALLED ON SEATTLE TRAWLER "SUNBEAM":

A chart table (fig. 1), mounted on the overhead and featuring electrically-driven chart-storage spools, has been installed on the trawler Sunbeam. Designed by the vessel's

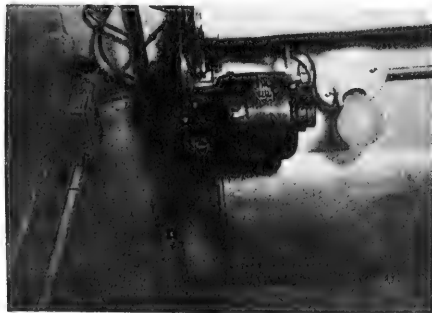


Fig. 1 - Drive motor and storage spools on underside of the chart table. The chart table is here shown as fixed to the ceiling of the cabin.

skipper, the new system provides quick and easy access to 25 navigational charts with a minimum loss of pilothouse space. When not in use, the hinged table is secured to the overhead with a cabinet latch.

When reference to a particular chart is necessary, the skipper unlatches and lowers the table to an inclined work position (fig. 2).



Fig. 2 - Use of chart table in an inclined work position.

As the table moves down from the overhead, a chart lamp is automatically turned on. To move the needed chart into position, a control lever, located under the lower edge of the table, is operated. This turns on the motor and engages a 2-way friction drive, causing charts to unroll from one spool and wind up on the other. Individual charts, fastened to one another with cellulose tape, move across the top of the chart table at a steady

pace of about 6 inches a second. Direction of rolling is reversed by changing the position of the control lever.

--By Richard L. McNeely, Electronic Scientist,
Branch of Exploratory Fishing,
Division of Industrial Research,
U. S. Bureau of Commercial Fisheries,
Seattle, Wash.

Note: Appreciation is expressed to Capt. Ward Nickols of the trawler *Sunbeam* for his cooperation in providing the opportunity to describe and photograph the chart table.

Alaska

NEW FILM ILLUSTRATES KING CRAB FISHING INDUSTRY OF KODIAK REGION:

National distribution is assured for the new 30-minute color sound film, *The King Crab Story*, recently completed by the Alaska Department of Fish and Game in collaboration with the Kodiak Chamber of Commerce and the king crab fishing industry of the Kodiak region. The film tells the story of the king crab and is to be used to stimulate sales for the industry's products.

The theme of the film emphasizes the contribution the giant king crab has made to the Kodiak Island area. A very few years back the Island's fishing potential was limited to a few months of summer fishing for salmon and halibut. Now the king crab industry goes into full swing around September each year and prospers through the winter providing work for many fishermen and the workers in processing plants. A half dozen processing plants operate on the Island for 8 months of the year.

The film begins with historical references to Kodiak as Alaska's oldest community. The town was established when George Washington was President. A biological sequence shows the work being done by a Departmental research biologist in a program designed to keep the industry functioning on a sustained yield basis. For the first time a king crab shedding its shell is recorded on film.

Other scenes depict the fishing fleet during winter gales and processing plant operations showing how the king crab is prepared for market.

The grand finale of the film is devoted to the annual King Crab Festival staged by the citizens of Kodiak during the month of May.

King crab burgers, skin diving for crabs, a crab-shaking contest, crowning of the King Crab Queen, and the king crab banquet are highlights of the festival. At the banquet in which all residents and visitors participate, prizes are awarded to local chefs who produce the most delectable and original king crab dishes. The final scenes show the fleet departing for the king crab fishing grounds.

* * * * *

SURVEY OF SUBSISTENCE FISHING MADE ON KUSKOKWIM RIVER:

A 485-mile boat voyage down the Kuskokwim River, which flows into the Bering Sea north of Bristol Bay, to obtain an estimate of the total number of salmon used for dog food and personal use by Alaskan natives was completed this summer, the Commissioner of the Alaska Department of Fish and Game reported. The voyage was made by skiff by members of the Arctic Commercial Fisheries Division staff.

The voyage began at McGrath and ended at Napakiak, about 50 miles from the Bering Sea, visiting all villages and fish camps en route.

Figures obtained provided a valuable index to the Kuskokwim catch and the degree of native dependence on these fishery resources. The survey, which is the first of its kind on the Kuskokwim, will be made annually hereafter.

The biologists found that an estimated 2,132 persons were subsistence fishing on the river. They caught an estimated total of 19,457 king salmon, 70,580 red salmon, and 266,487 chum salmon. Pink salmon, silver salmon, sheefish, whitefish, and smelt figured in the catch to a lesser degree.

The largest number of persons fishing and the largest catches of all species of salmon, except chums, came from the Bethel area between Napakiak and Kwethluk. The greatest chum salmon catch was from the Aniak-Little Russian Mission area.

Much useful information was collected during the trip on the timing of runs and the spawning areas of the various species.

The District Management Biologist, Anchorage, who heads the Arctic area projects said surveys of this kind will provide much needed data on fluctuations in the salmon runs on the Kuskokwim River.



Antarctica

WORM PARASITES OF POLAR FISHES TO BE STUDIED:

A new 30-foot, double-planked research cruiser, specifically designed and built for use in exploring the chilly waters of Antarctica, was loaded on the United States cargo ship *Pioneer Isle* at Newport News, Va., in mid-October 1960.

W. Stanley Wilson, special staff member of the Virginia Fisheries Laboratory, Gloucester Point, will use the vessel during the next 12 months at Wilkes Station on the fringe of that ice-covered continent around the South Pole. To withstand the grueling conditions of this bleak continent, the *Octans* (named for a constellation directly above the South Pole) was especially designed and constructed at a cost of over \$21,000, including enough spare parts for a year's operation.

The hull is double-planked and reinforced against ice with a quarter-inch steel prow and 1/8" stainless steel sheathing at the waterline. Although it is only 30 feet long, the craft weighs about six tons. A special heating unit will preheat the gasoline marine engine so that the boat may be operated at subzero temperatures, which are common in that part of the world.

Although Wilkes Station is cold when compared to winters in Virginia, it is ice free about seven months of the year. For the other five months the water freezes up to two feet thick, but breaks up periodically under the impact of winds which sometimes gust up to 100 miles per hour.

This open water is the reason for going to Wilkes rather than returning to McMurdo, where previous fishery explorations were conducted. In McMurdo it was necessary to cut through six feet of ice in order to set the traps and it was impossible to do any seining. At Wilkes base it will be possible to operate a trawl net, haul seines, and a variety of other fishing gear. Even during the five winter months it will be possible to collect some material during the period when the ice is broken up by the winds.

The *Octans* is equipped with a ship-to-shore telephone and will at all times tow a 14-foot aluminum boat with an outboard 18 hp. motor. Both boats can be used together for hauling seines, and the small boat will

serve as a lifeboat if necessary. There is a four-man rubber raft aboard, hand flares, and a flare pistol with several hundred rounds of ammunition.

The boat contains berths for two, an auxiliary generator, an alcohol stove, three bilge pumps (one automatic electric, another mechanical, and a third hand-operated), a depth-recorder (fathometer) which records depths up to 1,200 feet.

A special keel cooling system circulates antifreeze through the marine motor. A special guard around the propeller protects it from ice damage, and a power winch on deck will operate trawls, dredges, bottom grabs, and bottom corers. Deck lights are arranged for working at night, which will last 24 hours during the winter months.

One of the problems which will be faced is the freezing up of the nets as they are landed on deck. At such low temperatures the nets become stiff and unpliant almost as fast as they are taken out of the water.

Wilson will leave Gloucester Point to go South in early November, and expects to arrive at Wilkes base in mid-January 1961, which will be early summer in that part of the world. Only one ship a year brings supplies to the 23 people who operate that station. Besides Wilson, who is the only biologist in the group, there will be meteorologists and glaciologists. Wilson will remain there for the calendar year.

This expedition to Antarctica is financed by the National Science Foundation to enable Dr. William J. Hargis, Jr., Director of the Virginia Fisheries Laboratory, Gloucester Point, to study the worm parasites of these polar fishes. Hargis is sending Wilson to the Antarctic, Australia, New Zealand, and possibly Madagascar to collect fish parasites and parasites from birds and mammals in these far-flung regions to determine the world-wide distribution of various species.

In addition to collections of fishes, Wilson will collect many invertebrate animals, including crinoids, starfish, crabs, and mollusks. These will be distributed to the Smithsonian Institution and other leading museums in the United States.



California

RECOVERIES OF KING SALMON MARKED IN 1959 TO DETERMINE MIGRATION HAZARDS:

The first marked king salmon released in a California Department of Fish and Game experiment early in 1959 were recovered this year, that Department announced on October 21, 1960.

Young king salmon were released in four lots of 250,000 fish each at Chico, Rio Vista, and San Francisco Bay to determine the effect of downstream migration hazards.

Two lots were released in the Bay; one was trucked to Tiburon from the U. S. Fish and Wildlife Service's Coleman Hatchery, and another lot was trucked to Rio Vista, where the fish were transferred to a live-bait boat and delivered to the release site.

As of the fall of 1960, the marked fish were two years old, weighed 6 to 8 pounds, and were 20 to 26 inches long. Few of the fish were large enough (26 inches) for the commercial catch, but one commercially-caught salmon released at Rio Vista was recovered. In the ocean sport fishery, more were large enough (22 inches) to be landed. Six boated fish and one Rio Vista fish were recovered. In the Sacramento River, two Rio Vista and two Chico kings were caught.

Fish arriving at Coleman Hatchery during the first two weeks of the spawning season included 14 boated fish, 11 from the Rio Vista release, 9 from the Chico release, and 4 fish trucked to Tiburon.

These results are preliminary, but show that fish survived all types of releases and should be available as 3- and 4-year olds in sufficient numbers to make a valid comparison as to what part of the migration to the sea is most hazardous.

TRAWLING GEAR TESTED ON DUNGENESS CRABS:

M/V "Nautilus" Cruise 60N5-Crab: An experiment with crab trawling gear was conducted (June 25-July 10, 1960), by the California Department of Fish and Game research vessel *Nautilus* in Bodega Bay, Calif., to develop techniques for catching crabs. Other objectives of the survey were to initiate a standard procedure for random sampling of the fishing grounds; to obtain crab measurements for age and growth studies; and to determine crab shell condition (hard/soft) for life history studies.

A semi-balloon-type otter trawl of three-inch webbing was used in an attempt to catch quantities of Dungeness crabs, *Cancer magister*. Three daylight drags caught 13 crabs and three night drags yielded 7. Each drag covered approximately one linear mile of the bottom in a ½-hour period.

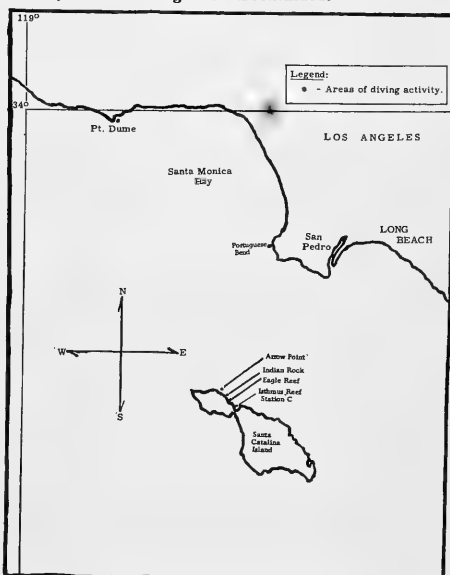
To determine the effectiveness of traps as compared to trawling, two strings of 18 40-inch traps, without escape ports, were placed in two locations at the sites of four drags. Each set covered about ¼ linear mile and was fished for a maximum of 24 hours. Since 169 crabs were taken by traps and less than 15 by net, it was decided to use traps for sampling.

Age and growth data were obtained from trapped crabs. In all, five strings of 18 traps were set.

INVESTIGATION OF ABALONE RESOURCES CONTINUED:

M/V "Nautilus" and Diving Boat "Mollusk" Cruise 60N7, 60M2-Abalone: Abalone investigations were continued from July 22-31, 1960, by the California Department of Fish and Game research vessel *Nautilus* and diving boat *Mollusk* in waters off Portuguese Bend, Pt. Dume, and Catalina Island. The objectives were (1) to make observations at abalone stations established in 1959; (2) to check other areas for commercial diving activities; (3) to check areas of skin diving; and (4) to collect and photograph in color various species of abalone.

Water conditions along the mainland were the worst encountered in years. A red tide made underwater visibility practically zero. Several dives were made at Portuguese Bend and Pt. Dume but because of opaque water, coastal diving was discontinued.



M/V *Nautilus* and diving boat *Mollusk* Cruise 60N7, 60M2-Abalone.

Operations were shifted to the Isthmus at Santa Catalina Island where exploratory and inspection dives were made. On the Isthmus Reef the kelp (*Macrocystis*) had practically disappeared and the resident pink abalone (*Haliotis corrugata*) were small with shrunken meats. Several red abalone (*Haliotis rufescens*) from San Miguel Island, tagged and released on the Isthmus Reef in February 1957, were found at depths of 100 feet. They had moved from shallow water to the deeper, colder waters off the reef. Eagle Reef and Indian Rock areas were also examined and here, also, the thick kelp found on previous dives in 1957 had disappeared.

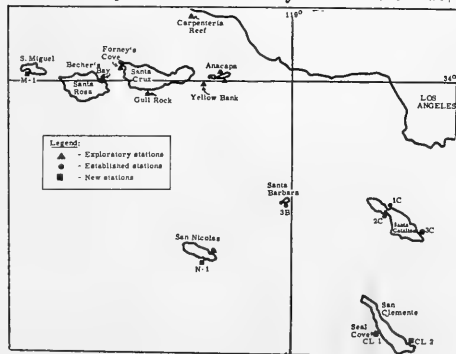
At Arrow Point, kelp and abalone were in approximately the same abundance as in 1957. Apparently the kelp growing along the shoreline of Santa Catalina Island is thick and healthy, while that on offshore reefs (Isthmus Reef, Eagle Reef, and Indian Rock) has practically disappeared. No evidence of commercial diving on the reefs off Santa Catalina Island was found. Several colored photographs were made of live green abalone (*Haliotis fulgens*) and white abalone (*Haliotis sorenseni*).

M/V "N. B. Scofield" and Diving Boat "Mollusk" Cruise 60S4, 86M3-Abalone. The investigations were continued (Aug. 3-14 and Aug. 20-30, 1960) by the Department's research vessel N. B. Scofield and diving boat Mollusk in waters off the Islands of Santa Catalina, San Clemente, San Nicolas, Santa Barbara, Anacapa, Santa Cruz, Santa Rosa and San Miguel, and Carpenter's Reef on the mainland coast. The objectives were (1) to examine established abalone study stations at Santa Catalina and Santa Barbara Islands; (2) to establish stations at San Clemente and San Nicolas Islands; (3) to collect and photograph various species of abalone in color; (4) to collect and ship black (*Haliotis cracherodii*) and pink abalone (*H. corrugata*) to the Hawaii Department of Fish and Game for transplanting on the island of Oahu; and (5) to establish stations at San Miguel Island and to check areas of commercial diving.

Stations established at Santa Catalina and at Santa Barbara Islands were inspected. Tagged abalone were collected and measured for growth rate studies. At Santa Catalina Island some growth was noted among the smaller abalone but very little among the larger ones since 1959. There was less algal growth at these stations than was observed a year ago. Near shore at Santa Catalina Island the kelp was heavy and in good condition. At Santa Barbara Island kelp growth was good but the abalone were not abundant nor were the young present in great numbers.

A station site was selected on San Clemente Island at Seal Cove. At this location vegetation and kelp were in excellent condition, there was an abundance of fish, and the pink abalone showed evidence of rapid growth. The abalone there were approaching spawning. At a second station, established on the east side of San Clemente Island above Pyramid Cove, algae, abalone, and fish were less abundant than at Seal Cove.

At San Nicolas Island visibility was restricted because of heavy sediment carried by wave action. Two



M/V N. B. Scofield and diving boat Mollusk Cruise 60S4, 60M3-Abalone.

temporary stations were established. At the station on the south side of the island, the kelp was in poor condition. Great numbers of kelp bass (*Paralabrax clathratus*) were seen and the few abalone present were in excellent condition and approaching the spawning season. At this station red abalone (*H. rufescens*) predominated.

At the station established on the northeast side of San Nicolas Island, kelp was very dense. There was considerable algal growth on the rocky substrate but only six pink abalone were found.

Many color underwater photographs were taken of various species of abalone. These pictures illustrate the differences in color and structure among the eight Californian abalones.

Young pink and black abalone could not be located in sufficient numbers to make an adequate shipment to Hawaii. They were not present in areas where found previously and high tides and rough waters prevented their being gathered from other known locations.

A station was established at San Miguel Island in a location fished by commercial divers. The red abalone at this station were numerous and in excellent condition. There was a heavy kelp bed, many invertebrates, and great numbers of fish at this station. San Miguel Island is not fished heavily by the commercial fleet because of rather constant adverse, weather conditions during all but a few months of the year.

Exploratory dives were made at Anacapa Island, and at Gull Rock and Forney's Cove on Santa Cruz Island. Red, pink, and green abalones observed were few in number and small in size. At Yellow Bank, between Anacapa and Santa Cruz Islands, pink, red and white abalone were in close association with each other. They were large and of excellent quality. The bottom is rocky, ledge-like and covered with a thick growth of elk kelp (*Pelagophycus porra*). Because of the depth (75 to over 125 ft.) time on the bottom was limited and only a small part of the area could be examined. Due to strong winds, diving at Santa Rosa Island was confined to Becher's Bay. Only a few pink abalone were observed although a large area was inspected. At Carpenter's Reef, there was a muddy bottom with poor kelp growth and a few small pink abalone. This entire area had a "dead" look.

Note: Also see *Commercial Fisheries Review*, April 1960 p. 19.

ALBACORE TUNA OFF SOUTHERN CALIFORNIA STUDIED:

M/V "Nautilus" Cruise 60N8-Albacore: The area off southern California within the latitudes 32° N, to 35° N, and longitudes 118° W, to 123° W, was surveyed by the California Department of Fish and Game research vessel Nautilus from August 16-29, 1960. The objectives were (1) to fish for albacore with trolling gear and to tag, measure, and release all viable ones, using dart and type-G spaghetti tags alternately; (2) to hang a light from the stern each night while drifting and to collect the marine organisms attracted to it; (3) to record sea-surface temperatures and weather conditions on the fishing grounds; (4) to obtain blood samples from albacore unsuitable for tagging; and (5) to preserve albacore stomachs.

Of the 160 albacore caught 149 were measured, tagged and released in good condition. All were taken on trolling gear.



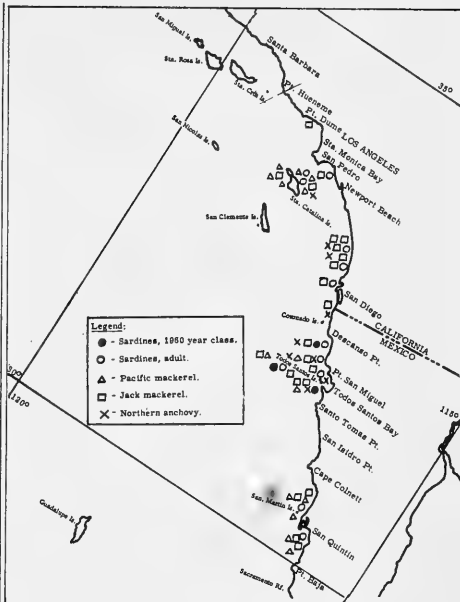
M/V Nautilus Cruise 60N8-Albacore Tagging (August 16-29, 1960).

Due to adverse weather conditions only 4 nightlight stations were occupied; 2 on the albacore fishing grounds 1 off Santa Rosa Island, and 1 at Santa Cruz Island.

Sea-surface temperatures were taken at least every 3 hours while scouting, and more frequently when in concentrations of fish. Weather and sea conditions were recorded intermittently throughout the day. Sea-surface temperatures ranged between 60.8° and 66.4° F. A majority of albacore (154) was caught in waters of 60.8° to 62.4° F. The remaining 6 were taken in 63.7° to 66.4° F. water. The largest albacore were caught in the warmer water.

PELAGIC FISH POPULATION SURVEY CONTINUED:

M/V "Alaska" Cruise 60A7-Pelagic Fish: The coastal waters from Punta Baja, Baja California, Mexico, to Point Dume and Santa Catalina Island, Calif., were surveyed (Aug. 11-30, 1960) by the California Department of Fish and Game research vessel Alaska. The objectives were: (1) to survey the sardine population to determine the amount of recruitment from the 1960 spawning and to measure the density of older fish; (2) to sample adult sardines, Pacific mackerel, jack mackerel and anchovies for age and distribution studies; and (3) to collect live sardines for genetic studies conducted



M/V Alaska Cruise 60A7-Pelagic Fish (August 11-30, 1960).

by the U. S. Bureau of Commercial Fisheries Laboratory at La Jolla.

Of the 78 light stations occupied, sardines were collected at 13, anchovies at 9, jack mackerel at 22, and Pacific mackerel at 14.

A total of 362 miles was scouted between stations and 67 schools were sighted, most of which were small spots making positive species identification unfeasible.

Weather conditions were generally good but a heavy swell hampered operations between Cabo San Quintin and Punta Banda.

Adult sardines (153-225 mm.) were sampled at 12 stations from Cabo San Quintin to Santa Catalina Island and young sardines (105-120 mm.) were taken at three stations between Punta Banda and the U. S.-Mexico border.

Approximately 200 live sardines were delivered to the U. S. Bureau of Commercial Fisheries in San Diego, for use in blood genetic studies.

Sea-surface temperatures ranged from 53.4° F. at Santo Tomas anchorage to 70.3° F. off La Jolla Point. Note: Also see *Commercial Fisheries Review*, November 1960 p. 22.



Cans--Shipments for Fishery Products, January-August 1960

Total shipments of metal cans during January-August 1960 amounted to 87,172 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 79,888 tons in the same period a year ago. The increase of about 9.1 percent in the total shipments of metal cans January-August this year as compared with the same period of 1959 was probably due to the sharp increase in the Alaska canned salmon pack.

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.



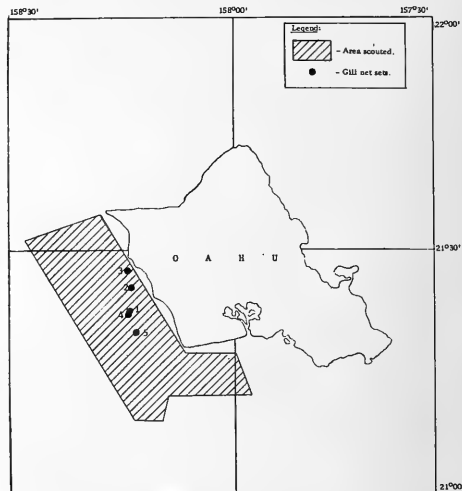
Central Pacific Fishery Investigations

EXPERIMENTAL NET FISHING FOR SKIPJACK TUNA:

M/V "Charles H. Gilbert" Cruise 49: Trial sets were continued (September 12-19, 1960) by the U. S. Bureau of Commercial Fisheries' research vessel Charles H. Gilbert in experimental gill-net fishing for skipjack tuna in the waters of Oahu's Waianae coast. Objectives of this cruise were to (1) determine the practicability of setting the gill net and retrieving it with a power block from the vessel; (2) establish procedures for setting and retrieving the gill net; (3) test gill net and power block as a device for capturing skipjack tuna under a variety of oceanographic conditions; (4) evaluate data collected by experiments with gill nets to determine the possibility of using tuna purse seines in this area; and (5) test sonic equipment and record various vessel and biological sounds.

The experimental gill net is composed of panels of webbing of $4\frac{1}{2}$ -11 $\frac{1}{2}$ inch stretched mesh, measured 304 fathoms long by 50 fathoms deep. The practicability of handling such a net was demonstrated in the trial set. The net was set in 3 minutes and 20 seconds on the first set. Several minor difficulties were encountered during retrieving but these were easily overcome and avoided on subsequent sets.

The net was payed out over the stern with the ship proceeding at 22 degrees starboard rudder and an engine speed of 1,000 r.p.m. The net was set in a circle as a result of this maneuver. Lines on both ends of the net were brought together to close the net as much as possible. During retrieving the net was passed through the power block and stacked on the main foredeck athwart ship, the leadline to starboard and the corkline to port. The power block was situated at the end of the boom just inboard of the starboard rail about 15 feet



M/V Charles H. Gilbert Cruise 49 (September 12-19, 1960).

above the deck. The ship proceeded along the net as it was being hauled.

Sets were attempted 4 times around schools of skipjack in seas less than a foot in height. Two and 8 skipjack, 9-12 pounds in weight, were caught in the first two sets. No fish were caught in the last two sets. It was impossible to tell whether the skipjack had escaped before the net was completely set, through the larger meshes after the net was set, or through the thermocline and under the leadline.

The failure of the gill net to encircle the skipjack schools indicates that the contemporary purse-seining method needs to be modified and the direction towards which it should be modified in order to catch skipjack. Modifications should be towards (1) increasing the time between the beginning of the set and detection (and likely escape) of the net by the skipjack, and (2) reducing the setting time. Lengthening the net so that the set can be started farther away from the school and distracting the school with live bait have been suggested to delay the detection of the net by the skipjack. One obvious way to reduce the setting time is to increase the ship's speed during setting.

A hydrophone from a Sonobuoy and a tape recorder were found to be a suitable combination for recording underwater sounds. Ship sounds at 4 knots and at 1 $\frac{1}{2}$ knots, with only auxiliary engines, were recorded. Recordings were also made during the soaking and hauling phases of the gill-net operations.

Note: Also see Commercial Fisheries Review, Nov. 1960 p.24.

FISHERY RESEARCH VESSEL "CHARLES H. GILBERT" ON 50th VOYAGE:

Half a hundred sailings was the record logged as the U. S. Bureau of Commercial Fisheries' research ship

Charles H. Gilbert left its Hawaiian base on October 12. Cruise 50 will take the 120-foot, 200-ton vessel south to Christmas Island, the Marquesas, the Tuamotus, and Tahiti on a two months' investigation of the biology of yellowfin and skipjack tuna. The waters along the Equator and around the island groups of the South Pacific are familiar territory to the vessel and its crew, as are the stormy albacore tuna grounds of the central North Pacific and the fog-bound waters of the West Coast. Ever since its delivery to the Bureau's Honolulu Biological Laboratory in April 1952, the ship has been on the go, from Adak to Papeete and from Astoria to Manzanillo, carrying parties of scientists over the central and eastern Pacific in search of knowledge about the tunas and their environment. The vessel has steamed, in the eight years of its service, more than 173,000 miles.

Originally equipped to do the long-line and live-bait fishing necessary to fill in the general picture of tuna distribution in the central Pacific, the ship has been progressively fitted out with a variety of specialized instruments and facilities as the interests of the scientists have become more sharply focused on specific aspects of the biology of the tunas. As the scope of the vessel's work has grown, so has the ship itself, with the addition of 28 feet of length in 1953 providing greater laboratory space, and the construction of a new bow section this year. The new bow contains one of the unique features of the vessel, an underwater viewing chamber for directly observing the behavior of tuna in the sea. With a matching installation of windows in the ship's bottom at the stern, the biologists are given a completely new insight into the movements of tuna schools and their response to various kinds of bait, fishing gear, and other stimuli.



The Service's research vessel Charles H. Gilbert.

The vessel's live-bait tank, in addition to its primary function of holding baitfish for use in pole-and-line fishing of tuna, has played a part in the introduction to Hawaiian waters of sardines from the Marquesas, and of snappers and other useful bottomfish from Tahiti and Mexico. The ship has been used for operating gill nets, as well as tuna long lines, and the recent addition of a power block makes it possible to handle nets of great size. A new trawl winch was installed this year for the operation of large midwater trawl nets to collect the young of the tuna and the variety of small animals on which tunas feed. This evolution of the Charles H. Gilbert to meet the needs of scientific research on elusive, fast-swimming, far-ranging species of fish has given the Honolulu Biological Laboratory a mobile marine research station that is probably as able and versatile as any vessel of comparable size. Whether the task is the collection of plankton in the North Pacific, or, as on the present cruise, taking samples of South Pacific tuna blood for serological studies, the Charles H. Gilbert

has met the demands made upon it in obtaining knowledge of the world's oceans and the fishery resources that inhabit them.

RESEARCH ON HAWAIIAN TUNA FISHERY BAIT PROBLEMS:

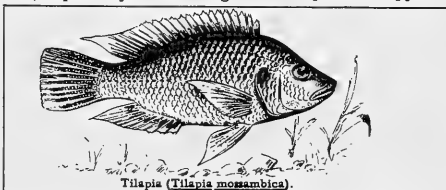
The annual skipjack landings in the State of Hawaii are frequently limited by an inadequate supply of live bait. The principal bait is nehu, a small anchovy.

During 1952, the Hawaiian Biological Laboratory of the U. S. Bureau of Commercial Fisheries began studies to determine the feasibility of supplementing the supply of natural bait. These studies included investigations into the use of artificial baits, introduction of Marquesan sardines into Hawaiian waters, the introduction of tilapia into various ponds and reservoirs in the State, the economics of rearing tilapia by hatchery methods, and the introduction of the threadfin shad. The objectives of these studies have been realized and they have been terminated.

Artificial Bait: The University of Hawaii, under contract, investigated the use of artificial bait during the period 1952-1953. The reactions of skipjack to both edible (agar, fish) and inedible (aluminum foil, mica flakes) materials were investigated. The results were generally negative or inconclusive.

Marquesan Sardine: The excellent live-bait qualities of the Marquesan sardine were demonstrated by Bureau vessels fishing for skipjack in waters of French Oceania. Hawaiian waters appeared to provide a suitable habitat for this species and an introduction of Marquesan sardines was made into Hawaiian waters in late 1955. Additional releases were made in 1956, 1957, and 1958. By 1957, adults in spawning condition were captured near the Island of Oahu and by September 1960, additional recoveries were reported from Kauai, Maui, Hawaii, Molokai, and Kahoolawe. Recoveries of young fish, indicating successful spawning in Hawaiian waters, were made during late 1958 and 1959. The State Division of Fish and Game placed restrictions on the capture of the Marquesan sardines in Hawaiian waters, pending their establishment. As these fish are now successfully established, the restrictions have been lifted, thus permitting Hawaiian fishermen to capture and use them as live bait.

Tilapia: Tilapia were first brought to Hawaii in 1951. From 1954 through 1956, sea tests were conducted to determine the effectiveness of these fish as a skipjack tuna bait. They proved to be an adequate bait fish, especially for the larger (18-24 pound) skipjack.



Tilapia (*Tilapia mossambica*).

Investigation into the economics of rearing tilapia were made at a small hatchery near the laboratory (1956) and at a larger hatchery on the Island of Maui (1957-1959). Simultaneously with the 1959 operation

of the Maui hatchery, experiments were conducted at the Kewalo Basin Laboratory to test methods for inducing early spawning and to determine optimal salinity, sex ratios, brood stock concentrations, and type and rate of feeding.

The application of the results of the Kewalo Basin experiments to the Maui hatchery, coupled with a warmer spring, resulted in the 1959 production of 1,293,000 tilapia, exceeding that for 1958 of 1,074,000. Bait-size tilapia from the Maui plant yielded an average catch of 46-50 pounds of skipjack per pound of tilapia used as live bait. Comparable figures for nehu were 50-57 pounds of skipjack per pound of nehu.

The favorable results of the investigations, both as to the success and economics of rearing tilapia by hatchery methods and their use as live bait, encouraged the Hawaii State Board of Agriculture and Forestry to request funds from the State Legislature for the construction and operation of a tilapia hatchery. About \$180,000 were appropriated. A site has been selected and construction of the plant is presently under way.

Threadfin Shad: A large shipment of threadfin shad was received in Hawaii during August 1959. These fish, after acclimatization to fresh water, were planted in various rivers and reservoirs on the islands of Maui, Kauai, and Oahu. The first successful indication of shad spawning was reported from a reservoir on the Island of Oahu on May 1, 1960, where 20 small schools of 1.5-3 inch shad were observed. On June 11, 1960, more than 200 shad were caught from a reservoir on the Island of Maui. The average length at time of planting was 9.5 centimeters (about 3.7 inches). Successful spawning in the Maui reservoir was evidenced by the capture of shad as small as 1.9 centimeters (0.7 inch). With the successful completion of the project to introduce the threadfin shad into Hawaiian waters, this potential bait species (which is prolific, can tolerate fresh or sea water, and has been proven by sea tests to be an excellent bait fish) is now available to the Hawaiian skipjack tuna fishermen.



Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-SEPTEMBER 1960:

Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.7 million pounds (value \$0.9 million) of fresh and frozen fishery products were purchased in September 1960 by the Military Subsistence Supply Agency. This was lower than the quantity purchased in August by 29.1 percent and was 4.1

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Supply Agency, September 1960 with Comparisons

QUANTITY				VALUE			
Sept.		Jan.-Sept.		Sept.		Jan.-Sept.	
1960	1959	1960	1959	1960	1959	1960	1959
..... (1,000 Lbs.) .....				..... (\$1,000)			
1,686	1,758	17,722	17,488	928	924	9,188	8,973

percent under the amount purchased in September 1959. The value of the purchases in September 1960 was lower, by 22.0 percent as compared with August, but was 0.4 percent higher than for September 1959.

During the first nine months of 1960 purchases totaled 17.7 million pounds (valued at \$9.2 million)--an increase of 1.3 percent in quantity and 2.4 percent in value as compared with the similar period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in September 1960 averaged 55.0 cents a pound, about 3.5 cents more than the 51.5 cents paid in August and 2.4 cents higher than the 52.6 cents paid during September 1959.

Canned Fishery Products: Salmon was the principal canned fishery product purchased for the use of the Armed Forces during Sep-

Table 2 - Canned Fishery Products Purchased by Military Subsistence Supply Agency, September 1960 with Comparisons

Product	QUANTITY				VALUE			
	Sept.		Jan.-Sept.		Sept.		Jan.-Sept.	
	1960	1959	1960	1959	1960	1959	1960	1959
Tuna	..... (1,000 Lbs.) .....				..... (\$1,000)			
Salmon	2,304	3	2,308	18	1,565	3	1,568	14
Sardine	-	4	99	974	-	4	41	144

tember this year. The annual requirements of canned salmon by the Armed Forces are usually contracted for shortly after the end of the canned salmon packing season. In the first nine months of 1960, purchases of canned fish were up 36.7 percent as compared with the same period in 1959, due primarily to the heavy purchases of canned salmon in September of this year.

Note: Armed Forces installations generally make some local purchases not included in the data given; actual total purchases are higher than indicated because local purchases are not obtainable.



Fish Meal

RESEARCH ON NUTRITIVE VALUE:

The research program on fish-meal quality by the U. S. Bureau of Commercial Fisheries College Park Technological Laboratory has revealed some interesting variations in chick-feeding tests. Over 39 fish-meal samples have arrived at the Laboratory. Of these, 19 have been analyzed for proximate composition and in a series of three different ten-day chick tests.

The Laboratory reports that the first series has just been completed, and the results have demonstrated some interesting differences in the nutritive quality of the fish meals tested. The nutritive quality of most of the fish-meal samples appears to be rather uniformly good, but a few appear to be considerably lower in quality than would be expected from a study of their processing history.



Fisheries Loan Fund

FISHERIES LOANS APPROVED JULY 1 TO SEPTEMBER 30, 1960:

From the beginning of the Fisheries Loan Fund program in 1956 through September 30, 1960, a total of 802 applications for \$24,818,068 have been received. Of these, 435 (\$10,556,897) have been approved, 286 (\$8,094,575) have been declined or found ineligible, 68 (\$4,234,422) have been withdrawn by applicants before being processed, and 13 (\$796,505) are pending. Of the applications approved, 162 were approved for amounts less than applied for. The total reduction was \$1,135,669.

The following loans were approved during July, August, and September of 1960:

New England Area: Clinton-Serafina, Inc., New Bedford, Mass., \$70,000 and John S. Cottle, Narragansett, R. I., \$24,300.

South Atlantic and Gulf Area: Captain Frankie, Inc., Tampa, Fla., \$25,000 and Clarence E. Potter, Marathon, Fla., \$6,822.

California: Joe M. Medina, et al, San Diego, \$120,000; M. Machado Medina, San Diego, \$100,000; Joseph M. Nunez, San Diego, \$90,000; and Frank J. Souza, et al, San Diego, \$110,000.

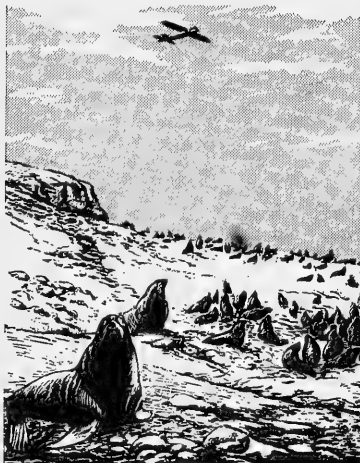
Pacific Northwest Area: Axel Buholm, Seattle, Wash., \$9,922; Erling E. and Harry J. Jacobsen, Seattle, Wash., \$41,872; and Robert K. Thompson, Port Angeles, Wash., \$4,200.



Fur Seals

ALASKA FUR-SEAL SKIN HARVEST FOR 1960 LOWER:

The 1960 harvesting of fur seals on the Pribilof Islands, Alaska, was terminated August 15, with a crop of 40,616 skins. Included were 36,304 pelts from male seals and 4,312 pelts from female seals. This compared with a take of 30,176 male seals and 27,634 female seals in 1959.



The 1960 take of male seals included about 30,000 3-year-olds and 4,000 4-year-olds, as well as 2,000 2-year olds. The small size of the take of 4-year olds lowered the kill considerably below normal; usually 4-year-old seals contribute 30 to 40 percent of the year's kill. The small size of the 1956 year-class was recognized in 1959 when a shortage of 3-year-old animals caused a below-normal take, and the limited harvest this year had been expected because of this deficiency.

Since 1956 the U. S. Bureau of Commercial Fisheries has been engaged in a herd management program. Through maintenance of the herd at a level of maximum sustainable productivity, such fluctuations in the herd as were encountered in the 1956 year-class can be avoided in the future. It is expected that the value of the reduction in surplus-breeding stock accomplished since 1956 should soon be reflected in improvement in the annual crops of fur-seal skins.

ECONOMIC STUDY OF SEAL SKIN PRICES INITIATED:

An economic study of prices of Alaska's fur-seal skins has been started by the Bureau of Business Research, Boston College. This is being conducted under a contract awarded by the U. S. Bureau of Commercial Fisheries.

The annual harvest of fur-seal skins from the Pribilof Islands is divided three ways under an international treaty: the United States receives 70 percent of the skins, Canada 15 percent, and Japan 15 percent. The United States' share is now further divided under the Alaska Statehood Act--70 percent of the net income from the sale of the skins, after deduction of costs of administration of the Pribilofs, is turned over to the State of Alaska.

For budgetary purposes the Bureau of Commercial Fisheries must estimate the proceeds of the sales of skins for a period up to three years in the future. This study involves the analysis of factors which affect the price of Alaskan fur skins to provide methods by which the Bureau may estimate the prices which may be anticipated for periods up to three years.

* * * * *

PRICES FOR ALASKA FUR-SEAL SKINS AT FALL 1960 AUCTION HIGHER:

At the semi-annual auction sale of Alaska fur-seal skins held at St. Louis on October 20-21, 1960, a total of 28,210 United States-owned fur-seal skins was sold for \$2,510,890 for the account of the United States Government. Of these, 6,338 skins were the newly-developed "sheared" skins which were offered for sale for the first time. These are known as "Lakoda," a name derived from an Aleutian word meaning young female fur seal. The "Lakoda" skins, unlike the familiar "Matara," "Kitovi" and black Alaska fur seal skins are not dyed and the guard hairs are not removed prior to shearing. The new product was received enthusiastically by the fur trade. All skins are the product of the sealing operations of the U. S. Bureau of Commercial Fisheries on the Pribilof Islands. The 21,872 United States-owned dyed fur-seal skins (exclusive of the "Lakoda" skins) brought \$2,282,436 or about 0.5 percent less than the \$2,293,580 received for 22,561 such skins at the spring 1960 auction. However, the over-all average price of \$104.35 per skin paid at the fall 1960 auction was up about 2.6 percent from the av-

erage of \$101.66 paid at the spring auction and 1.1 percent higher than the \$103.23 average price received at the fall 1959 auction. The "Lakoda" skins, sold for the first time this fall, brought \$228,464 or an average of \$36.05 per skin.

At the fall 1960 auction, the average prices for the skins by types were: dust-brown or "Matara" \$103.22 per skin, black \$106.83, and the dark shade "Kitovi" \$101.50. Japanese Government fur-seal skins sold: black \$101.66, "Matara" \$96.01, average for all skins \$97.81. All South African fur-seal skins averaged \$46.31 and all Uruguayan skins averaged \$51.75.

Note: Also see Commercial Fisheries Review, June 1960 p. 28, and December 1959 p. 35.



Great Lakes Fisheries

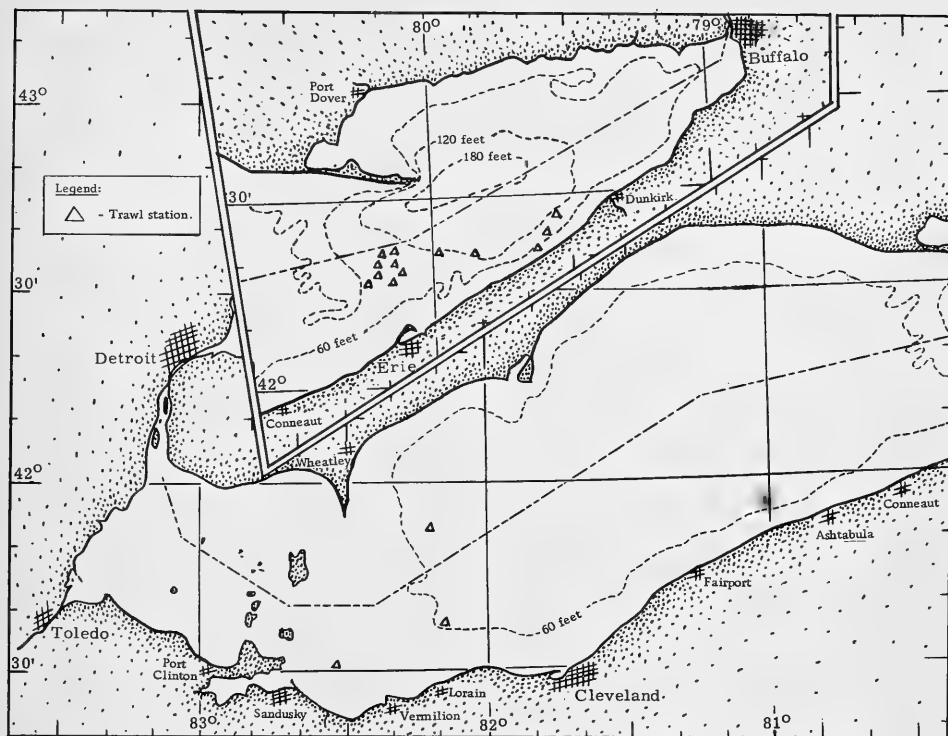
Exploration and Gear Research

SEASONAL DISTRIBUTION STUDIES OF COMMERCIAL FISH STOCKS IN LAKE ERIE CONTINUED:

M/V "Active" Cruise 12: Trawl fishing and sounding operations were carried out (Aug. 30-Sept. 23, 1960) from Buffalo, N. Y., to Sandusky, Ohio, by the U. S. Bureau of Commercial Fisheries' exploratory fishing vessel *Active*. This survey was designed to determine seasonal abundance, distribution, and availability-to-otter trawls of smelt and other under-utilized species of fish in United States waters of Lake Erie.

Test trawling was conducted only where depth-sounder recordings indicated the presence of fish near the bottom. With exception of a relatively small area off Erie, Pa., extensive soundings and 15 subsequent fishing efforts were not very encouraging. Two 30-minute drags at a depth of 78 feet, 10½ miles northwest of Erie, produced a total of 2,450 pounds of 17-19 count smelt.

Some 5 additional drags made in 72 to 78 feet of water between Erie and Dunkirk, N. Y., caught smelt at rates of 50, 60, 78, 100, and 180 pounds per hour. Six other drags in this area at depths of 50 to 78 feet yielded only trace amounts of fish. Three of these 6 drags indicated the presence of large numbers of young-of-the-year smelt. Two 30-minute drags made in about 60 feet of water off Vermilion and Sandusky, Ohio, caught no smelt but the one off Vermilion took 90 pounds of yellow perch.



M/V *Active*, Cruise 12, Lake Erie (August 30 to September 23).

One 30-minute drag, made in Canadian waters about 20 miles southeast of Wheatly, Ont., caught 90 pounds of smelt from 66 feet of water.

The area between Erie and Vermilion and west of Sandusky revealed no fish near the bottom.

During the first two days of the cruise, the *Active* participated in a lake-wide synoptic survey involving 11 vessels and 6 research agencies including the Bureau of Commercial Fisheries. Objectives of the synoptic survey included making simultaneous oxygen determinations and related fish population analysis over all of Lake Erie.

Note: Also see *Commercial Fisheries Review*, Nov. 1960 p. 32.

Great Lakes Fishery Investigations

LAKE ERIE POPULATION SURVEY:

M/V "*Musky II*" September 1960: The U. S. Bureau of Commercial Fisheries research vessel M/V *Musky II* has replaced the chartered vessel *George L.* in its operations on Lake Erie. The *Musky II* is 45 feet long with a 14½-foot beam and is powered by a 671 GMC Diesel.

Late September water temperatures (70° F.) and turbidity (Secchi disc 3½ feet) in 1960 in the western basin were almost identical to findings in 1959 at the same stations. Summer water temperatures in 1960 were much cooler than in 1959.

The September trap- and gill-net catches of yellow pike from major ports in Ohio consisted almost entirely of yearling fish (hatched in 1959). Commercially-landed yearling yellow pike averaged about 14.2 inches long (maximum 16.2 inches) and slightly more than one pound in weight. Up to 50 pounds of yellow pike per trap-net lift were observed in some areas in the western basin. Prices of landed yearling yellow pike (Number 2's) dropped from about 50 cents per pound in early September to about 35-40 cents per pound in late

September. Commercial catches of other species in September have been very low and fishermen often are dependent upon yellow pike for profits.

Yellow pike apparently do not recognize International boundaries. Forty-seven percent of the 53 tagged yellow pike returned in September were from Canadian waters. The returns were from the 4,000 yellow pike tagged in Ohio waters in the spring of 1960.

Yearling yellow pike fed almost entirely on $3\frac{1}{2}$ - to $4\frac{1}{2}$ -inch young-of-the-year alewives and gizzard shad in September. The young alewives are abundant in most waters of the western and central basins, but large concentrations of gizzard shad appear only in the western basin. Unless heavy natural mortality occurs, gizzard shad and alewives in 1961 and 1962 may become a nuisance to commercial fishermen. Examination of fish stomachs indicated that alewives were feeding almost exclusively on animal plankton and gizzard shad on plant plankton.

The character of the white bass fishery in September resembled that of the yellow pike fishery. Most white bass landed were yearlings. They had grown very rapidly; the average yearling was about 10 inches long--maximum length was 11.3 inches. The relatively great abundance of both the 1959 and 1960 year classes of white bass should provide a reasonably strong fishery for several years.

Fish species listed as "suckers" in commercial landing reports have been examined at several points in the western basin. Most abundant were the common white sucker (*Catostomus commersoni*) and central quillback carpsucker (*Carpilodes cyprinus hinei*). Less common species were eastern quillback carpsuckers (*Carpilodes cyprinus cyrinus*), northern shorthead redhorse (*Moxostoma aureolum*), and the spotted sucker (*Minytrema melanops*). Six other species of suckers are known to occur in Lake Erie. Bismouth buffalo, although a member of the sucker family, are listed separately in fish catch reports.

Although experimental trawl, and trap- and gill-net catches of yellow perch in September generally have been poor, anglers had phenomenal success in catching yellow perch along the south shore in the western basin. Many anglers caught 15-20 yellow perch per hour. An unusual number of young-of-the-year white crappie were taken in trawls this summer. Black crappie are much less abundant than white crappie in Lake Erie.

Note: Also see *Commercial Fisheries Review*, Nov. 1960 p. 32.

LAKE MICHIGAN FISH POPULATION SURVEY CONTINUED:

M/V "Cisco" Cruise 8: The fish population survey in southern Lake Michigan was continued (September 20-October 4, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Cisco. Gangs of nylon gill nets (50 feet each of $1\frac{1}{4}$ - and $1\frac{1}{2}$ -, 200 feet of 2-, and 300 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -, $2\frac{1}{4}$ -, 3-, $3\frac{1}{2}$ -, and 4-inch mesh) were set overnight at 25 and 50 fathoms off Grand Haven, Mich., and off Racine, Wis. The chub catch was moderately large at 25 fathoms off Grand Haven, but light in the other sets. Both 25-fathom sets contained small numbers of smelt and alewives, and both 50-fathom sets had a few deep-water sculpins.

Gangs of linen gill nets were set for 4 nights off Grand Haven at 25 fathoms (255 feet each of $2\frac{3}{8}$ -, $2\frac{1}{2}$ -,

$2\frac{1}{4}$ -, $2\frac{1}{2}$ -, and 3-inch mesh) and 50 fathoms (510 feet of each of the above mesh sizes). Both these nets took many more bloaters (*L. hoyi*) and fewer individuals of non-bloater species of chubs than did identical nets set in the same locations on about the same dates in 1954.

A commercial-type 52-foot balloon trawl was fished at various depths off Grand Haven and Milwaukee, Wis. The chub catches were the largest in several cruises. The tows off Grand Haven were 4 to 7 miles south of an east-west line out of Grand Haven except for the 45- and 50-fathom tows which were just north of this line. Off Milwaukee the 30- and 35-fathom tows were 8-10 miles northeast, and the others 10-12 miles north of port.

The great difference in chub catches at 14 and 15 fathoms (consecutive tows) may be due to the fact that the upper limit of the thermocline touched bottom at 14 fathoms, and the bottom temperature at this depth was appreciably warmer than at 15 fathoms. Yellow perch, smelt and shiner catches in the two tows were also strikingly different: at 14 fathoms--1,134 perch (172 pounds), no smelt, 482 spot-tail shiners, 21 emerald shiners, 21 trout-perch, 171 alewives, 7 whitefish; at 15 fathoms--266 perch (44 pounds), 192 smelt, no shiners of either species, 74 alewives, 4 whitefish. Five of the 11 whitefish in the two tows were over 17 inches in length. The catch in the 10-fathom tow was much like the one at 14 fathoms, except that there were no whitefish. Catches at the other depths were almost exclusively chubs (95 to 100 percent of which were bloaters), except at 45 and 50 fathoms, where considerable numbers of deep-water sculpins were taken (181 pounds at 50 fathoms).

Surface water temperatures averaged about 64° F. Extremes recorded were 51.4° and 67.5° F. A well defined thermocline still existed, but the epilimnion has become thicker. Strong currents to the south prevailed on the east side of southern Lake Michigan throughout much of the cruise.

Note: Also see *Commercial Fisheries Review*, Nov. 1960 p. 32.

WESTERN LAKE SUPERIOR FISHERY SURVEY CONTINUED:

M/V "Sisacwet" Cruise 6: The third and last cruise of the season to study the bathymetric and areal distribution of fish stocks in western Lake Superior was conducted (September 12-20, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Sisacwet. Standard gangs of experimental gill nets and 30-foot semi-balloon trawls were fished at various locations and depths.

The experimental gill nets were fished just southeast of Gull Island and south of Stockton Island. Trawling operations took place southeast of Gull Island, Pike's Bay, between Outer and Cat Island, east and south of Cat Island, between Manitow and Oter Island, and between Ironwood and South Twin Island.

Four gangs of experimental gill nets were fished southeast of Gull Island at 15 fathoms to determine the differences in catches from successive 1-night sets and the differences between catches in 1-, 2-, 3-, and 4-night sets. Three gangs were set one day and a fourth on the following day. On the following 3 days, one each 1- and 2-night, 1- and 3-night, and 1- and 4-night sets were lifted with one net reset the first two days.

The catch increased with the number of nights only for the lake trout, lake herring, and smelt. There seemed to be little relationship between the duration of set and number of fish caught for the other species. However, the total number of fish caught increased with the duration of the set. The 2-night set took 59 percent more fish than the average of the 1-night sets; the 3-night set took 82 percent more fish than the average 1-night set; and the 4-night set took 153 percent more than the average 1-night set.

The lake herring taken in this experiment were extremely large. Two hundred and forty-four lake herring



were caught in the 2½- to 5-inch mesh. These fish weighed 288.5 pounds, an average of 1.2 pounds each.

Experimental gangs of gill nets were set south of Stockton Island at 5, 15, 25, and 45 fathoms. Trawl tows took predominately ninespine stickleback, trout-perch, and slimy muddlers at all stations. Good samples of pygmy whitefish were taken between Manitow and Otter Island in 25 fathoms. These fish were nearly ready to spawn. A few small lake trout and whitefish were taken around Cat and Otter Island but none were young-of-the-year. Trawl tows in Pike's Bay at 20 fathoms, and near Cat Island and Otter Island at 25 fathoms yielded small lake trout which had the left pectoral fin clipped. These fish were planted by the Wisconsin Conservation Department in early May 1960. The distance from Otter Island to the nearest site of planting is about 18 miles. These catches give further evidence that the shore plant was successful.

Surface-water temperatures ranged from 58.7° F. south of Stockton Island to 56.3° F. southeast of Gull Island.

M/V "Siscowet" Cruise 7: In continuation of a long-term observation of environmental conditions and fish populations in western Lake Superior fall environmental conditions were studied (Sept. 26-Oct. 5, 1960) at index stations located southeast of Stockton Island, Northeast of Bear Island, and east of Pike's Bay. Standard gangs of gill nets were fished at each station, and trawling operations were conducted at the Stockton Island and Pike's Bay stations. Limnological data and materials were collected including: records on water temperatures, water samples for chemical analyses, plankton and bottom samples, and Secchi-disc readings.

There was a marked thermocline at the Stockton Island and Bear Island stations. At Bear Island the water temperature was about the same (56° F.) from the surface to 145 feet, at which point there was a rapid drop in temperature for the next 55 feet (thermocline), and at 200 feet the temperature was about 42° F. The temperature at the bottom (260 feet) was 40° F. Dissolved oxygen was found to be lowest at the surface (11.0 p. p. m.) and highest on the bottom (13.1 p. p. m.).

In addition to the environmental studies, trawling operations took place between South Twin and Ironwood Island, and oblique sets were made with bull nets (gill nets 300 feet long and 20 feet deep) southeast of Gull Island and northeast of Madeline Island. A standard

gang of gill nets was also set northeast of Madeline Island adjacent to the oblique bull net.

Bull nets fished southeast of Gull Island and northeast of Madeline Island were set from the surface to the bottom at 120 feet. The float line of the nets was marked at 20-foot intervals, and, since the depth of the net from float line to lead line was 20 feet, each section of the net fished overlapping 40-foot depth intervals.

The catch of lake herring per 1,000 feet of bull net that fished from the surface to 20 feet at the Gull Island station was 210 fish weighing 220 pounds. The catch decreased as the depth increased.

Trawl tows took predominately slimy muddlers and ninespine sticklebacks at all locations. Several small trout (5 to 14 inches) and whitefish were captured. No young-of-the-year trout have been seen this year. One 15-minute tow at 25 fathoms between Ironwood and South Twin Island captured 564 "bloaters" (*L. hoyi*) weighing 108 pounds. This was by far the largest catch made in a trawl by the Siscowet.



Surface-water temperatures ranged from 54.5° F. southeast of Gull Island to 58.2° F. in Pike's Bay.

Note: Also see *Commercial Fisheries Review*, November 1960 p. 33.

SEA LAMPREY CONTROL FOR 1960 SEASON ENDED:

A number of streams tributary to Lakes Superior and Michigan were treated with chemicals for the destruction of lamprey larvae during the 1960 season by the U. S. Bureau of Commercial Fisheries Great Lakes Fishery Investigations biologists. It is anticipated that by the end of the year all of the lamprey-producing streams on Lake



Superior will have been treated by United States and Canadian biologists. The seasonal change of water quality that impairs the selective action of the toxicant was more troublesome than usual this year and persisted longer. Sea lamprey research included bioassays at Hammond Bay and in the mobile unit to study further the seasonal trends of water quality. Surveys to define the distribution of the lamprey larvae in Lake Michigan tributaries have now been extended to the east shore.

Electrical control on Lake Superior terminated on September 2, 1960. The 35 barriers captured 39,694 adult sea lampreys; the same barriers took 46,838 adults during 1959 and 60,367 in 1958. The 1960 total represents a reduction of 15.3 percent from 1959 and 34.2 percent from 1958. However, after 2 consecutive years of declining numbers, the catch at the installations on the east half of Lake Superior increased. These barriers took 24,160 adults in 1960, 17,128 in 1959, and 21,487 in 1958. A drastic drop at the de-

vices on the west half of the Lake was great enough to overcome the increase in the east. The western barriers took 15,534 individuals in 1960 and 29,709 in 1959—a reduction of 14,175 adults or 47.7 percent. Over half of this drop occurred in the Brule River which took only 9,755 adult sea lampreys this season as compared to 19,386 in 1959.

The last of 17 electrical barriers on Lake Michigan was turned off on August 5, 1960. Two additional devices were operated by the Wisconsin Conservation Department as part of the network. The 19 devices killed or captured 16,704 adult sea lampreys. The 1959 network of 37 barriers took 27,552 adults. The 19 barriers operated in both years took 23,076 adults during 1959. The 1960 catch represents a reduction of 6,372 individuals, or 27.6 percent. This is the third consecutive year of a decline in the sea lamprey catches in streams tributary to Green Bay, Lake Michigan.



Gulf Exploratory Fishery Program

BOTTOM FORMATIONS SURVEYED AND VARIABLE PITCH PROPELLER TESTED:

M/V "George M. Bowers" Cruise 29: A preliminary survey of Middle Ground bottom formations was conducted between July 29-August 8, 1960, by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel George M. Bowers operating in the Florida Middle Grounds approximately 80 to 90 miles south-southeast of Cape San Blas, Fla. This cruise was conducted through a cooperative agreement between the U. S. Bureau of Commercial Fisheries and the University of Florida Geology Department.



Service's exploratory vessel George M. Bowers.

Four diving stations were made at depths from 14 to 20 fathoms. Samples were taken of coral rock, sand, and sedentary organisms.

Still photographs and color motion pictures of the coral reefs were taken to supplement the observations and collections.

Cruise 30 (October 3-15, 1960): Underwater motion-picture studies of shrimp trawls in action were scheduled off Panama City, Fla. Due to heavy algae concentrations along the entire coastal area, photographic work was not attempted.

During the period, speed tests were conducted using the controllable pitch propeller recently installed on the George M. Bowers. Repeated runs were made over a $1\frac{3}{4}$ -mile course in St. Andrews Bay, towing a 40-foot flat shrimp trawl. Holding the main engine constant at 800 r.p.m. and setting the propeller pitch at varying angles, accurate ground speed determinations were made. The information gained will be of considerable value in future shrimp-trawl work.

* * * * *

MISSISSIPPI DELTA AREA SURVEYED FOR SARDINE-LIKE SPECIES:

M/V "Oregon" Cruise 70: Experimental fishing for sardine-like species using submarine lights, trap-lift nets, and a lampara net, was conducted in the Mississippi Delta area (September 6-25, 1960) by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon. Most of the planned work for this cruise was not accomplished due to interruptions by hurricanes Donna and Ethel.

Seven night-light attraction stations were made using 100- and 250-watt submarine lights and 500-watt surface lights. Echograms showed the reaction of scad and round herring when a 100-watt light was lowered to a depth of 14 fathoms over bottom schools which were initially at a depth of 48 fathoms. On other occasions the schools moved up to midwater depths of 20 to 25 fathoms, but would not surface. Lift-net catches contained either mixed scad and round herring or round herring only. The highest catch was about 100 pounds of the mixed species.

Two large tuna schools were observed off the Mississippi Delta. One school was sampled with trolling jigs and yielded blackfin tuna weighing 4 to 10 pounds and skipjack weighing 3 to 12 pounds. Sea conditions were too rough to attempt setting the lampara net.

A total of 52 bushels of calico scallops was caught off eastern Alabama in 16 fathoms using a 25-foot shrimp trawl. One 30-minute drag yielded 40 bushels. These scallops were shipped to several concerns that are engaged in developing and testing mechanical shucking devices.



Irradiation Preservation

MARKET FEASIBILITY STUDY FOR IRRADIATED FISHERY PRODUCTS UNDER WAY:

To determine the conditions under which radiation-processed fishery products should be marketed in order to provide the greatest over-all benefits to the fishing industry--producer, processor and distributor--and to the consumer, a study is being conducted by the U. S. Bureau of Commercial Fisheries for the Atomic Energy Commission.

A radiation-processing briefing session was held for Bureau marketing specialists at the Gloucester, Mass., Technological Laboratory to provide them with necessary background information for the study.

Bureau marketing specialists will be discussing the feasibility of marketing fishery products with fish producers, processors, and distributors, along with retail food groups and consumer specialists, such as newspaper food editors and extension people. A comprehensive analytical report on this study will be ready for submission to the Atomic Energy Commission on November 1, 1960.

The Atomic Energy Commission is reserving action on a number of research grants pending the outcome of this Bureau study on fish and a similar study on fresh fruits and vegetables being conducted by Stanford University.



Maine Herring Investigations

RECOVERIES FROM TAGGING AID STUDIES:

The Penobscot River-Blue Hill Bay herring tagging program by the U. S. Bureau of Commercial Fisheries Biological Laboratory at Boothbay Harbor, Maine, has been completed. Recoveries of herring tags from

the August 23, 1960, tagging at Moores Harbor, Isle Au Haut, have been unusually encouraging. Of 531 tagged herring released, 18 recoveries have been received.

Records from earlier tagging at Cutler, Maine, show that herring can move along the coast at 10 miles a day, the longest known movement having been 50 miles in 5 days. This knowledge has been used in revising sampling methods for age and growth studies.



North Atlantic Fisheries Exploration and Gear Research

EXPLORATORY FISHING VESSEL "DELAWARE" BACK ON SCHEDULE:

The U. S. Bureau of Commercial Fisheries research vessel Delaware is back on its routine task of carrying out research projects designed to aid commercial fishing. The 500-ton vessel had an odd mishap last July when she became stuck halfway up a marine railway in a shipyard--she was being dry-docked for routine maintenance service and for the installation of a new underwater searching device whose purpose is to locate and track schools of fish as well as reveal the presence of underwater obstacles such as sandbars, shoals, sunken vessels, etc.



The Service's research vessel Delaware.

What proved to be a puzzling and complex problem of refloating the Delaware was overcome and she sailed from New London late in October on a cruise to familiarize Bureau personnel with the use of her new "seeing as well as hearing" aid which should permit the search of two miles of adjacent waters for the presence of fish.

The Delaware is being assigned to undertake cruises involving experiments with new and improved fishing gear, the distribution of fish populations, and collection of data for the project on future haddock resources underway at the Bureau's Woods Hole Biological Laboratory.

The Delaware, largest of the Bureau's research vessels, is manned by a crew representing experience in both commercial fishing and fisheries research and is used to carry on activities designed to: explore potential fisheries and fishing grounds; estimate the seasonal availability and the migrations of possible commercial species; introduce more efficient methods of harvesting the resources either by improvement of existing gear or by the introduction of fishing gear not customarily used in this area, and to develop, test, and evaluate electronic and other aids new to the commercial fishing industry.



North Atlantic Fishery Investigations

SURVEY OF DISTRIBUTION AND ABUNDANCE OF GROUND FISH IN INSHORE NURSERY AREAS CONTINUED:

The vessel Capt. Bill III, chartered by the U. S. Bureau of Commercial Fisheries' Biological Laboratory at Woods Hole, Mass., completed the third of a series of cruises, to determine the distribution and abundance of bottom food fishes found in inshore waters. Special emphasis was placed on the small haddock which might be taken by trawlers using small-mesh gear, and upon the young-of-the-year haddock which were beginning to settle to the bottom in September. The survey was made in the vicinity of Cape Cod and the area between Cape Ann and the Isles of Shoals.

Haddock, whiting, and herring were found to be the most abundant of the food fishes.

Dogfish were so numerous and so destructive to fishing gear that many stations could not be sampled.

Two types of drift bottles have been released on each cruise. The surface drift bottle floats on the top water layer at the whim of the tide, current, and wind. The bottom drag bottles, ballasted so as to float just off the bottom, are moved by the currents on the ocean bottom.

These bottles are released in order that a more thorough understanding of the movement of the water in the Gulf of Maine may be applied to the movement of fish sought by the commercial fishermen.



Omaha, Nebraska

CONSUMPTION OF FROZEN FISH AND SHELLFISH IN RESTAURANTS AND INSTITUTIONS:

Although Nebraska is landlocked, frozen fishery products are purchased and served by the many restaurants and institutions in the city of Omaha, according to a 10-city survey made by Crossley S-D Surveys, Inc., for the U. S. Bureau of Commercial Fisheries.

About nine-tenths of the 174 establishments surveyed reported buying fishery products during the 12 months ending November 1958. About 48 percent of these said they purchased frozen processed fish in November 1958; 32 percent frozen processed shellfish; and 27 percent bought portions. Institutions (such as schools and hospitals) made more use of frozen processed fishery products than did public eating places.

Haddock fillets were the most popular and also the leading fish in total quantity purchased. More than two-fifths of the Omaha users of frozen processed fish bought haddock fillets during November 1958. Ocean perch fillets were the second most popular item, while cod and halibut fillets scored high on the list.

Almost half of the shellfish users in Omaha bought breaded shrimp during the survey month. Many bought frozen raw shrimp, which was the leader in terms of total quantity purchased.

More than a fourth of all the establishments in Omaha bought portions during No-

ember 1958. In this category, Omaha ranked first among the 10 cities, in percentage of



establishments buying portions. The portions most widely purchased were uncooked and breaded and the quantity purchased was much greater than that of any other type. In comparing portion-purchases, more than half of the establishments bought about the same amount during November 1958 as the year before. About one-fourth said they bought more, while 9 percent said they bought less. More than 90 percent of the users were satisfied with the present preparation, quality, and condition of both fish and shellfish. Satisfaction with the same features of frozen fish portions was unanimous by purchasers in Omaha.

The major advantages of portions were convenience and ease of preparation, cited by 67 percent of users... fast and timesaving, by 51 percent... size and uniformity, by 36 percent. Frying was the leading method of cooking frozen processed shellfish, fish, and portions. The average establishment served almost two-thirds of its shellfish fried, about 53 percent of its processed fish fried, and 78 percent of its portions fried. Baking was also a common cooking method for processed fish. The average establishment served 33 percent of this type fish baked.

Three-fourths of the profit-making establishments, which expressed an opinion, considered frozen processed fishery products more profitable than other high protein foods.



Oregon

NEW SHRIMP TRAWLING GROUNDS FOUND OFF COAST:

The first signs of good shrimp trawling grounds have been reported in waters offshore of Bandon (Coquille Point), Oregon, by biologists aboard the U. S. Bureau of Commercial Fisheries research vessel, John N. Cobb, as a result of a cooperative survey with the Oregon Fish Commission. Oregon Fish Commission biologists reported on October 10, 1960, that more than a week of exploration for new shrimp grounds off Coos Bay was not rewarding as the area was too rocky for trawling. Experimental drags off Coos Bay made in areas fished by commercial fishermen revealed only small numbers of shrimp.



South of Coos Bay soundings by electronic equipment proved the area offshore of Bandon soft and free of rocks, and subsequent trawling produced some fair-sized shrimp at a depth of from 90 to 105 fathoms. The field party chief on the vessel explained that, while experiments thus far are inconclusive as to concentrations of shrimp in sufficient quantities to establish a commercial fishery, the Bandon area presented the best grounds for trawling so far.

The John N. Cobb will continue exploring for shrimp grounds north to the Umpqua area (weather and time permitting) and as far north as Newport. (Fish Commission of Oregon, October 11, 1960.)

SALMON REARING LAKE CONSTRUCTION BEGINS:

A contract for construction of facilities for the 20-acre Lake Wahkeena fish-rearing experiment was awarded on October 19, 1960, by Oregon's Fish Commission.

Fish-rearing ponds and lakes are relatively new in Pacific Northwest fish culture. The use of both artificial and natural ponds

and lakes for salmon rearing is proving to have merit. The impoundments vary in size from a few acres to many square miles. The small fish planted in these basins are expected to subsist on natural foods, but feeding of hatchery food may be necessary. Preliminary results have been encouraging.

The plan is to construct a 20-acre pond in the former stream bed between the old and new U. S. Highway 30 in the Columbia River Gorge area at Wahkeena Creek, about 15 miles west of Bonneville Dam. Facilities will be provided to prevent Columbia River water and scrap fish from entering the lake. Specified numbers of salmon fry will be obtained from the Bonneville Hatchery and released in the lake where they will feed naturally. Physical and chemical tests of the water will be made and biological information collected to determine the natural productivity of the lake. Release of the fish will be early in the year, prior to plantings initiating a new cycle.

On a smaller scale, a similar rearing lake of 8 acres on the Millicoma River near Coos Bay is in operation where the fish are fed artificially instead of naturally. The Millicoma Lake is owned by a timber company and the fish rearing is supervised by the Fish Commission. Early in February 1960, 80,000 silver salmon fingerlings were liberated from this pond into the East Fork of the Millicoma River which runs into the Coos River.

The Wahkeena operation will be for the purpose of determining the most economical method of rearing large numbers of juvenile silver salmon in a pond. Current practice is to stock about 2,000 fish per surface acre without feeding, but this varies from pond to pond and year to year. Future tests may be made to determine whether the pond production can be increased by fertilizing the water and by artificial feeding.

In order to maintain the natural productivity of the water once the pond is filled, only sufficient stream water for desirable oxygen levels and temperatures will be allowed to flow into the lake. The remainder will flow down the present channel into the Columbia River.

Fish will be collected at intervals throughout the year to study the growth of the young silver salmon used in rearing studies.

The fish to be used will be planted as yolk-sac fry in the early part of the year. Length of rearing time will depend on water conditions in the Columbia River, consistent with natural migration time.

Fish will be allowed to migrate at will and be counted as they move over the spillway. However, if a large number of fish remain in the pond, it will be drained to enumerate and liberate these fish into the Columbia and then refilled in time to receive a new crop of young fish.



Wahkeena Creek offers little spawning area to returning adults. Mature migrants will be trapped in Wahkeena Creek, spawned by hatchery personnel, and hatched at Bonneville Hatchery to provide a supply of eggs to maintain the pond.

It will take four months to complete the lake which should be ready to accommodate the small salmon by March 1961.



Oysters

MARYLAND OBSERVATIONS ON SPAWNING AND SETTING AS OF OCTOBER 1, 1960:

An interesting light oyster set occurred in St. Marys River, Maryland, during mid-September 1960. No heavy late set was found at any of the stations conducted by the Maryland Chesapeake Biological Laboratory. While water temperatures generally were still high enough up to October 1 to permit some spawning, it seems quite unlikely that further setting will occur this year. The oysters were spawned out and water temperatures were about due to fall below the level at which spawning occurs.

Very few observations of the commercial set on planted shells had been made. A report of counts made by the Department of Tidewater Fisheries indicated a valuable set on the dredged-up shells planted in Pig Cove. The latest count of a composite sample taken across those shells by a light scrape showed 810 spat per bushel.

The picture of oyster mortalities is one of major concern. The organism "MSX" associated with the Delaware Bay losses has become more widespread in the lower Chesapeake. The Virginia Fisheries Laboratory reported substantial oyster losses in June and again in September in the lower James, the Mobjack

Bay area, and at points along the Bay side of the Eastern Shore of Virginia. The organism has been found in most tributaries of the lower Eastern Shore as far up as Pocomoke Sound and in the lower part of the Rappahannock.

At the Maryland sampling stations in Holland Straits, Pocomoke Sound, and Fishing Bay "MSX" had not yet been found but an increased mortality from the fungus Dermocystidium occurred in late summer and early fall, especially in Holland Straits. This fungus has been observed for many years in the lower Bay and is found generally up to the Solomons area, and to a light extent in deep water in the Choptank River off Castle Haven Point. It often causes some mortality at this season but has not appeared in other portions of the State and apparently does not thrive in low salinity areas.

Oxygen deficiencies occurred in the Chesapeake during August that probably caused losses among oysters in deep water at locations where mixing of the water is poor. This condition disappeared after mid-September. A few reports of deep-water oyster losses, probably a result of the above condition, were reported this season.

The spread of "MSX" is almost certain to affect oysters in the lower portions of Maryland in the near future. An intensive survey of the oyster beds in all Maryland areas was started early in October 1960 in cooperation with the U. S. Bureau of Commercial Fisheries and the Department of Tidewater Fisheries.

It is not yet known whether or not stable low salinity waters, such as occur in the upper Chesapeake, will serve as a barrier to destructive mortalities of the Delaware Bay type. Laboratory experiments at Solomons are being started where the development of "MSX" infections at low salinities can be determined.

It is extremely important that no transplantings be made of "MSX"-infected oysters to uninfected areas, either in waters of high or low salinity. In the higher salinities it is known that such infected oysters will succumb rapidly and can infect other oysters. In low salinities a similar but undetermined risk exists.

Continued research by all agencies upon oyster mortalities is planned to include: (1) accurate determination of rates of mortality by all agents under different environmental conditions; (2) complete knowledge of the life cycle of the "MSX" organism; (3) the method of infection of oysters by "MSX"; (4) the role in oyster mortality played by bacteria, virus infection, and other organisms; (5) the effects of changed environmental conditions upon oyster mortality; and (6) the selection and development of resistant strains of oysters in affected areas. Much time and painstaking effort is needed to gain adequate knowledge of this nature. ("Third Report of Spat-fall and Other Oyster Observations - 1960 Season," Maryland's Chesapeake Biological Laboratory, Solomons, Md.)

STANDARDS RESEARCH PROGRAM SHIFTED FROM VIRGINIA LABORATORY:

The Government-Industry Cooperative Oyster Research Program (GICORP) sponsored and financed by the U. S. Bureau of Commercial Fisheries, the U. S. Food and Drug Administration, and the Oyster Institute of North America, has shifted its research operations from Gloucester Point, Va., to the U. S. Bureau of Com-

mercial Fisheries Technological Laboratory, College Park, Md. The College Park location will not alter the research progress, but will allow closer contact with the research team by the Research Director of GICORP who is also located nearby on the campus of the University of Maryland.

Preliminary evaluation of the data collected over the past two years by the research team indicates that possibly the work in the Middle Atlantic area can be completed within a short time. The research team will then move on to the Gulf and West Coasts to determine the physical and chemical characteristics of the oysters when processed under the procedures used in those areas. Those objective tests developed in the initial survey in the Chesapeake Bay area will be used to classify the characteristics of the oysters in the additional areas. The extension of the work to these other areas is necessary to provide a basis for the development of a single standard of identity applicable to all domestically-produced fresh-shucked oysters.



Scallops

CALICO SCALLOP FISHERY IN FLORIDA:

Supply: Exploration by U. S. Bureau of Commercial Fisheries research vessels in 1960 located extensive scallop (Pecten gibbus) grounds off the Florida east coast from Daytona Beach southward to Ft. Pierce in a depth range from 10 to 32 fathoms. Commercial concentrations are now known to exist over a 1,200 square mile area, perhaps the largest known scallop bed in the world. Simulated commercial production, based on 16 experimental tows by the exploratory fishing vessel Silver Bay along the 20-fathom curve, produced 135 bushels ranging from 1 to 13 per 30-minute drag for an average of 8.5 bushels. Highest catch rate with a 10-foot New England-type dredge was 24 bushels per tow. Predominant size range in experimental catches was 2 inches to 2½ inches diameter shell. Commercial production by industry has not yet been undertaken.

Other scallop beds had been located off Cape San Blas, Fla., as early as 1957 in the vicinity of Panama City. The greatest exploratory catch rates, as high as 40 bushels per tow, were in 10- to 20-fathom depths. Local producers have periodically utilized scallops in this area as the price and demand situation warranted.

Other exploration has shown that sizable scallop concentrations exist in the Core Banks area off North Carolina. Some commercial fishing of these stocks started in 1959. Little is known about the biology of the calico scallop or about the growth rate. Some studies have recently been started by the Bureau's Gulf Breeze (Fla.) Biological Laboratory.

Cost of Gear: A modified Georges Bank-type scallop dredge, 10-foot mouth with 2-inch rings and 1½-inch mesh liners, costs approximately \$350 (perhaps less for local construction).

Estimated cost of rigging shrimp vessel for scalloping, including dredges, is \$1,000 to \$2,000 depending on vessel design. As far as is known at this time, no vessels have been converted.

Yield: Florida east coast catches in the spring of 1960 yielded 4 to 5 pints of meats per bushel of shell stock. Average meats run 900 to 1,100 per gallon. There is a definite variation in yield and quality, but the exact causes are yet undetermined. Further exploratory fishing planned on a seasonal basis should shed some light on these factors. It is assumed that these are associated with seasonal conditions of water temperature, maximum spawning activity, or some mortality factor.



Fig. 1 - The yield of one drag by the exploratory fishing vessel Silver Bay on the Florida east coast calico scallop grounds.

Shucking: Hand shucking is comparatively slow because of small size, shape of shell, and necessity for separating scallop meats from viscera. Mechanical shuckers are being investigated. One type of mechanical oyster shucker is reported to open 250 bushels of scallops per hour, but will not separate meats from viscera. The blanching of the scallops with steam causes muscle release on both shells. Scallops are then tumbled in a cylindrical drum where the shells exit from the end and meats and viscera fall through.



Fig. 2 - Shucked calico scallop meats aboard the exploratory fishing vessel Silver Bay.

Shell particles are separated from the meats by flotation. Industry members are experimenting with this method. The Bureau's Technological Laboratory at

Pascagoula is exploring the use of a centrifuge as a separator. There is a possibility that an egg-spinning machine can be adapted for this purpose. The Laboratory has also developed a prototype combination hot water and vacuum apparatus to accomplish production-line mechanical shucking. All developments are still in the early experimental stages; however, some machine makers have shown interest in development of equipment.

Quality: Tender, tasty, appetizing. From limited observations, keeping quality under refrigeration appears good. Pascagoula Technological Laboratory is running some experiments on freezing and storage with final results unavailable until storage time elapses.

Market Situation: Supply of New England scallops is now very plentiful. The Florida Development Commission is active in promoting the use of calico scallops and development of beds as well as possible market outlets. Any large-scale production of calico scallops will require active market promotion to acquaint consumers with the product. New product development with scallop ingredients offers another possibility for improved market.

Byproduct Possibility: Scallop waste or viscera has been shown by Japanese researchers to have unusual growth rate stimulation when mixed with poultry feed. Research needs to be done on this for a more definite determination of scallop waste value as applied specifically to calico scallops.

CHEMICAL COMPOSITION TO BE STUDIED:

The chemical composition of sea scallops is the objective of a joint research project by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass., and the Biological Laboratory at Woods Hole, Mass.

The biologists will collect sea scallops together with information on maturity and state of sexual development and on the area from which they were caught. The Technological Laboratory will analyze the adductor muscle (edible portion) and viscera of the samples for proximate composition, sodium, potassium, and amino acids. It is hoped through this cooperative program, to be able to obtain information on some of the basic factors that contribute to changes in the chemical composition of scallops and to provide additional data that may be useful in biological research on this shellfish. The study will continue for at least a year, during which time it is planned to expand this joint effort to include other species of fish and shellfish.

LANDINGS FROM GEORGES BANK TO BE LOWER IN 1961:

The unusual abundance of sea scallops on certain parts of Georges Bank in 1959-60 was the result of an unusually heavy set in 1955, according to U. S. Bureau of Commercial Fisheries biologists.

The Bureau's Woods Hole Laboratory biologists first found the 1955-year class in May 1959, when they were still too small to be of commercial value. At that time it was possible to catch up to 3,000 scallops in a 30-minute drag of a 10-foot scallop dredge.

The New Bedford scallop fishing fleet began to fish on that ground in July 1959. At first, they kept only the larger individuals of the 1955 age group, but by November 1959 all had grown large enough to be harvested, and by that time this single age group accounted for over 90 percent of the landings from that ground.

By May of 1960, the population in the area had been reduced to the point where it was only possible to catch about 800 sea scallops in a 30-minute drag. They were, of course, larger and the fleet continued to work the ground until September of this year when it was finally abandoned.

The same situation, although not quite so spectacular, had prevailed on two other grounds during the same period. Those grounds also appeared to be about fished out by September 1960.

Bureau records show that a drop in landings has always occurred in the fall. About 60 percent of an average year's landings of sea scallop meats are made between April and September. The colder, windier months of October through March account for only about 40 percent of a year's total. On this basis alone, landings are expected to decline some.

In addition, the 1956 age group, which is now large enough to be worth shucking, is not present in as great numbers as the unusually abundant 1955 age group. Bureau biologists, therefore, expect that landings of sea scallop meats will drop somewhat during the last 3 months of 1960 to the level of about 3.5 million pounds which prevailed during the last quarter of the years 1955-1958.

Landings in 1961 will no doubt be lower than in 1960, but whether they will be lower than 2 or 3 years ago depends upon the abundance of the 1957 age group which will enter the fishery in the summer and fall of 1961. As part of its investigation of the many factors that affect the abundance of commercially-important species of our marine resources, the biologists will sample the 1959 age group in the spring of 1961.



Shrimp

LOUISIANA INITIATES MARKING PROGRAM:

The Louisiana Wild Life and Fisheries Commission, Oysters, Water Bottoms, and Seafood Division, initiated a shrimp-marking program in the summer of 1960. The program is part of a cooperative effort of the Gulf States Marine Fisheries Commission and the U. S. Bureau of Commercial Fisheries to determine patterns of movement of certain species of shrimp from the nursery ground, located in the estuarine areas along the Gulf Coast, to the offshore fishery where these shrimp are captured by the commercial shrimp fisheries, according to the Commission Director.

During the second week of June 1960, workers of the Louisiana Wild Life and Fisheries Commission caught and marked with a biological stain, 12,000 juvenile brown shrimp, *Penaeus aztecus*. These shrimp were taken, marked, and released in the western portion of Mississippi Sound.

Under this program, juvenile shrimp will be stained and released in two additional areas. The areas are the Barataria Bay Estuarine Composite and the Vermilion Bay Estuarine complex. Over 10,000 brown shrimp will be marked and released, at each site, with hope of a good recovery.

A reward is offered for each marked shrimp returned. By establishing this reward it is hoped that more cooperation and interest will be stimulated among the shrimp fishermen, dealers, and processors. "A surveillance and coverage of the shrimp fishery along with organized advertising of the staining program will insure a higher recovery of marked shrimp. The returns should be of sufficient quantity to yield valid data which will be utilized in formulating management plans to protect, promote, and prolong one of our most valuable marine resources," the Chief of the Oysters, Water Bottoms and Seafood Division said.

Fifty cents reward will be paid for each returned shrimp, stained with a fast green biological dye. The chemical is harmless to humans. (Louisiana Conservationist, July-August-September 1960.)



Sport Fishing

ALMOST TWENTY MILLION FISHERMEN IN 50 STATES:

During 1959 a total of 19,914,021 fishermen in 50 states purchased one or more licenses to fish, the U. S. Department of the Interior reported on October 30, 1960. This is a slight decline of 1.3 percent from the number of fishermen reported during 1958.

Fishermen in 50 states spent a total of \$50,374,832 for fishing licenses, tags, permits, and stamps required by state fish and game departments to legally fish for sport or recreation. During 1958 sport fishermen spent \$45,410,462 for the same purposes. Expenditures for 1959 exceeded those for 1958 by \$4,964,370.

Examination of certified data for 1959 indicates that the number of persons buying one or more licenses to fish for sport or recreation varies from year to year. The number of licenses sold is influenced by types of licenses available to fishermen, weather conditions, the relative abundance of fish and other factors.

Table 1 - Summary of Number of Paid Fishing License Holders, License Sales, and the Cost to Fishermen in United States, July 1, 1958 to June 30, 1959

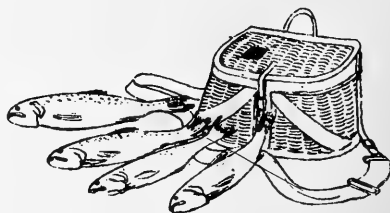
States	Paid Fishing License Holders ^{1/}	Total Fishing Licenses, Tags, Permits, and Stamps Issued ^{2/}	Gross Cost to Fishermen
Alabama	511,882	519,717	\$ 784,548.30
Alaska	31,836	51,990	127,388.94
Arizona	205,895	210,180	567,514.00
Arkansas	489,729	489,729	1,205,713.55
California	1,475,977	3,407,196	6,230,229.31
Colorado	406,130	406,130	1,458,737.50
Connecticut	109,018	109,072	418,032.89
Delaware	11,524	11,960	22,395.60
Florida	495,333	521,180	1,052,795.50
Georgia	500,565	515,758	669,217.25
Hawaii	2,383	2,383	5,116.00
Idaho	244,570	244,828	948,750.00
Illinois	699,300	699,300	1,512,636.25
Indiana	742,131	746,012	1,047,068.25
Iowa	400,447	383,301	753,024.87
Kansas	254,715	254,720	522,456.75
Kentucky	402,393	402,393	969,836.85
Louisiana	192,290	192,290	259,106.00
Maine	218,226	220,008	781,088.62
Maryland	95,765	97,323	330,155.75
Massachusetts	226,305	227,642	648,888.88
Michigan	1,056,462	1,259,034	3,072,276.00
Minnesota	1,238,250	1,409,751	2,140,002.15
Mississippi	264,144	273,449	559,732.12
Missouri	665,819	794,700	1,815,826.72
Montana	232,731	232,731	493,728.50
Nebraska	191,979	228,442	454,815.00
Nevada	58,164	59,026	253,175.50
New Hampshire	134,118	134,297	439,959.04
New Jersey	153,608	239,349	602,429.90
New Mexico	143,075	143,075	541,987.40
New York	783,362	980,511	2,205,416.75
North Carolina	400,495	475,812	862,562.75
North Dakota	87,304	87,304	93,752.00
Ohio	838,708	875,766	1,208,197.50
Oklahoma	469,638	469,638	1,047,524.50
Oregon	325,278	403,438	1,240,599.75
Pennsylvania	629,635	647,314	2,132,285.00
Rhode Island	15,717	21,942	52,977.87
South Carolina	278,079	280,244	540,752.70
South Dakota	138,893	138,988	264,056.00
Tennessee	791,393	885,132	1,137,190.50
Texas	825,793	825,793	1,776,195.19
Utah	190,960	195,036	558,881.47
Vermont	111,795	111,795	266,246.25
Virginia	403,245	558,554	735,635.00
Washington	366,366	366,366	1,561,239.87
West Virginia	207,899	249,289	455,187.65
Wisconsin	1,032,463	1,032,460	3,051,755.00
Wyoming	162,184	189,383	525,693.00
Totals	19,914,021	22,861,880	\$50,374,832.17

^{1/}A paid license holder is one individual regardless of the number of licenses purchased. Data certified by state fish and game departments.

^{2/}Period covered not identical to period covered by certification for all states.

Source: Compiled from information furnished by state fish and game departments.

Some state fish and game departments require sportsmen to purchase separate licenses



tags, permits, or stamps for fishing different species of fish as well as for fishing in different areas. Other states issue only one fishing license which is good for all species of legal fish. Thus, the total number of tags, licenses, permits, or stamps sold is not an accurate reflection of the number of persons holding paid licenses to fish.



Tuna

PROGRESS MADE IN STUDIES ON COMPOSITION:

A project to determine the composition of tuna and tuna-like fish has been under way for more than a year in the U. S. Bureau of Commercial Fisheries Technological Laboratory in Seattle, Wash. Compared to other salt-water species, it has been determined as of August 1960, that tuna and tuna-like fish are low in moisture and sodium and high in protein. The oil content varies within the range of 1 percent to 15 percent.

The study involves the collection of two series of ten fish each, taken each season over a three-year period. The investigation of skipjack is in its first year and albacore in its second year. Some exploratory composition work has also been done on both bluefin and yellowfin tuna.



U. S. Fishery Landings,

January-August 1960

Landings of fish and shellfish in the United States during the first eight months of 1960 totaled 3.0 billion pounds--about 3 percent less than for the same period of 1959.

Table 1 - United States Fishery Landings of Certain Species for Periods Shown, 1960 and 1959 ^{1/}					Table 2 - United States Fishery Landings by States for Periods Shown, 1960 and 1959 ^{1/}				
Species	Period	1960	1959	Total 1959	Area	Period	1960	1959	Total 1959
		.....(1,000 lbs.).....					.....(1,000 lbs.).....		
Anchovies, Calif.	8 mos.	2,200	2,022	7,174	Maine	8 mos.	203,300	186,289	265,958
Cod:					Massachusetts 2/:				
Maine	8 mos.	2,400	2,290	2,694	Boston	8 mos.	76,200	79,741	113,257
Boston 2/	8 "	11,100	13,046	17,709	Gloucester	8 "	136,500	161,489	228,723
Gloucester 2/	8 "	2,200	2,216	3,233	New Bedford	8 "	58,200	77,943	107,961
Total cod	...	15,700	17,552	23,636	Provincetown	8 "	17,700	17,183	27,700
Haddock:					Total Mass.		288,600	336,366	477,641
Maine	8 mos.	2,300	2,405	3,405	Rhode Island 3/:	7 mos.	38,400	80,968	101,648
Boston 2/	8 "	54,700	52,990	72,378	New York 3/:	7 "	25,900	23,217	39,387
Gloucester 2/	8 "	9,500	10,219	12,103	New Jersey 3/:	7 "	39,700	33,093	63,404
Total haddock	...	66,500	65,614	87,886	Maryland 3/:	8 "	40,100	42,106	60,847
Halibut 3/:					North Carolina 3/:	8 "	38,200	41,737	62,724
Alaska	8 mos.	19,300	20,414	22,537	South Carolina 3/:	8 "	10,700	9,288	18,654
Wash. and Ore.	8 "	15,300	16,201	17,908	Georgia	7 "	11,500	9,610	21,513
Total halibut	...	34,600	36,615	40,445	Florida 3/	7 "	82,200	79,288	148,724
Herring:					Alabama	8 "	14,400	12,100	14,022
Maine	8 mos.	105,800	83,174	117,150	Mississippi 3/:	6 "	7,100	8,055	78,866
Alaska (season over)	9 "	56,000	107,444	107,444	Louisiana 3/:	4 "	20,600	21,670	94,191
Industrial fish, Me. & Mass. 4/	8 "	30,900	72,482	103,312	Texas 3/:	8 "	32,300	40,731	92,913
Mackerel:					Ohio (season: Mar.-Dec., (Mar.-July)		13,900	14,361	18,586
Jack	8 mos.	43,600	15,810	37,507	Alaska:				
Pacific	8 "	14,100	12,792	37,602	Halibut 4/	8 mos.	19,300	20,414	22,537
Menhaden	8 "	1,482,200	1,528,240	2,193,866	Herring (season over)	9 "	56,000	107,444	107,444
Ocean perch:					Salmon	9 "	203,000	147,278	147,278
Maine	8 mos.	55,100	51,089	75,225	Washington	7 "	57,600	70,563	156,200
Boston	8 "	700	1,968	3,280	Oregon	7 "	25,700	26,974	51,700
Gloucester	8 "	47,100	40,663	58,197	California:				
Total ocean perch	...	102,900	93,720	136,702	Certain species 5/	8 mos.	315,600	293,681	431,089
Salmon:					Other	5 "	31,200	35,632	82,339
Alaska	9 mos.	203,000	147,278	147,278	Total Calif.		346,800	329,313	513,428
Washington	7 "	2/ 4,000	2/ 5,668	42,308	Hawaii	6 mos.	4,700	7,031	16,570
Oregon	7 "	2/ 2,400	2/ 2,866	5,329	Rhode Island, Middle Atlantic, Chesapeake, South Atlantic, and Gulf States (menhaden only)	8 mos.	1,466,000	1,499,746	2,153,423
Sardines, Pacific to Oct. 6		29,100	19,775	74,367	Total all above		3,046,000	3,146,632	4,731,558
Scallops, sea (meats), New Bedford	8 mos.	13,000	12,294	18,814	Others not listed		6/	6/	368,442
Shrimp (heads-on):					Grand total		6/	6/	5,100,000
South Atlantic & Gulf States	8 mos.	130,200	120,289	219,509	1/Preliminary.				
Wash.	7 "	1,200	2,045	3,046	2/Landed weight.				
Oregon	7 "	400	2,114	2,734	3/Excludes menhaden.				
Squid, Calif.	8 "	600	15,482	19,653	4/Dressed weight.				
Tuna, Calif.	to Sept. 30	226,000	227,800	254,786	5/Includes catch of anchovies, jack and Pacific mackerel, Pacific sardines, squid, and tuna. Data on tuna are through September 30 and on Pacific sardines through October 6.				
Whiting:					6/Data not available.				
Maine	8 mos.	10,700	21,923	23,339	Note: Data principally represent weight of fish and shellfish as landed except for mollusks which represent the weight of meats only.				
Boston	8 "	200	492	687					
Gloucester	8 "	40,700	44,040	61,797					
Total whiting	...	51,600	66,455	85,823					
Total all above items		2,616,000	2,657,531	3,766,371					
Others (not listed)		430,000	489,101	1,333,629					
Grand total		3,046,000	3,146,632	5,100,000					
1/Preliminary.			3/Dressed weight.						
2/Landed weight.			4/Excludes menhaden.						

The greatest declines occurred in production of fish used in the manufacture of fish meal and oil. Landings of these fish in Maine and Massachusetts during the first eight months of 1960 were down 42 million pounds while the menhaden catch decreased 48 million pounds compared with the same period of 1959. Total landings of herring in Alaska dropped from 107 million pounds in 1959 to 56 million pounds. Among the species used primarily for food, production of whiting during the first eight months of the year dropped 15 million pounds below that of the comparable period of 1959.

A considerable increase was reported in the Alaska salmon fishery which totaled 203 million pounds in 1960—a gain of 56 million pounds over 1959. Compared with the same period of 1959, landings of Pacific sardines through October 8, 1960 (29 million pounds) were up 9 million pounds, the catch of California tuna through September 30 (226 million pounds) remained almost the same; and the production of jack mackerel during the first eight months increased 28 million pounds.

On the Atlantic Coast the first eight-months' catch of Maine herring increased 23 million pounds and ocean perch landings rose 8 million pounds over the same period of 1959. During the first eight months of 1960, shrimp landings of 130 million pounds—up 10 million pounds over the comparable period of 1959—were reported in the South Atlantic and Gulf States.



United States Fishing Fleet^{1/} Additions

JULY 1960:

A total of 48 vessels of 5 net tons and over were issued first documents as fishing craft during July 1960—a decrease of 12 vessels

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, July 1960

Area	July		Jan. - July		Total
	1960	1959	1960	1959	
	(Number)				
New England . . .	7	2	19	10	15
Middle Atlantic . . .	2	1	11	6	12
Chesapeake . . .	3	11	41	56	106
South Atlantic . . .	7	15	34	59	76
Gulf	7	12	50	88	135
Pacific	16	11	87	70	97
Great Lakes	2	-	9	5	6
Alaska	4	8	18	28	32
Total	48	60	269	322	479

Note: Vessels have been assigned to the various areas on the basis of their home ports.

as compared with the same month in 1959. The Pacific area led with 16 vessels, while the New England, South Atlantic, and Gulf

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, July 1960

Net Tons	Number
5 to 9	24
10 to 19	14
20 to 29	3
30 to 39	2
40 to 49	2
50 to 59	1
60 to 69	1
230 to 239	1
Total	48

areas were next with 7 each. Alaska followed with 4 vessels, the Chesapeake with 3, and the Middle Atlantic and Great Lakes with 2 each.

During the first seven months of

1960, a total of 269 vessels were issued first documents as fishing craft—53 less than were reported during the same period of 1959. Most of the decline occurred in the Gulf area—38 vessels less as compared with the 1960 seven-months period.

* * * * *

AUGUST 1960:

During August 1960, 45 vessels of 5 net tons and over were issued first documents as fishing craft—an increase of 9 vessels

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, August 1960

Area	August		Jan. Aug.		Total
	1960	1959	1960	1959	
	(Number)				
New England . . .	6	1	25	11	15
Middle Atlantic . . .	1	-	12	6	12
Chesapeake	7	4	48	60	106
South Atlantic . . .	6	8	40	67	76
Gulf	10	14	60	102	135
Pacific	12	7	99	77	97
Great Lakes	3	-	12	5	6
Alaska	-	2	18	30	32
Total	45	36	314	358	479

Note: Vessels assigned to the various areas on the basis of their home ports.

as compared with the same month of last year. The Pacific area led with 12 vessels. The Gulf was second with 10 vessels followed by the Chesapeake with 7, and the New England and South Atlantic areas with 6 each. The Great Lakes and the Middle Atlantic areas accounted for the remaining 4 vessels.

During the first eight months of 1960, a total of 314 vessels were issued first documents as fishing craft—44 less than the same

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, August 1960

Net Tons	Number
5 to 9	28
10 to 19	8
20 to 29	4
40 to 49	2
50 to 59	2
250 to 259	1
Total	45

period of 1959. Most of the decline occurred in the Gulf area—a drop of 42 vessels, as compared with the eight-months period of last year.



U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, AUGUST 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States:

^{1/}Includes both commercial and sport fishing craft.

during August 1960 increased by 6.2 percent in quantity and 8.7 percent in value as compared with July 1960. The increase was due primarily to higher imports of frozen albacore and other tuna (up 2.5 million pounds), fresh and frozen salmon (up 1.2 million pounds), and to a lesser degree, an increase in the imports of canned tuna in brine, frozen shrimp, and lobster and spiny lobster. The increase was partly offset by a 3.8 million-pound decrease in the imports of groundfish fillets and blocks.

Compared with August 1959, the imports in August this year were up by 14.1 percent in quantity and 21.7 percent in value due to higher imports of frozen albacore and other tuna (up 8.4 million pounds), and frozen shrimp (up 1.3 million pounds). Compensating, in part, for the increases was a drop of about 1.0 million pounds in the imports of fresh swordfish and canned salmon (down 1.0 million pounds).

Item	QUANTITY			VALUE		
	August 1960	1959	Year 1959	August 1960	1959	Year 1959
	(Millions of Lbs.)			(Millions of \$)		
Imports:						
Fish & shellfish:						
Fresh, frozen, & processed ^{1/}	98.0	85.9	1,070.5	27.5	22.6	309.6
Exports:						
Fish & shellfish:						
Processed only ^{1/} (excluding fresh & frozen)	2.3	4.6	68.0	1.5	1.6	22.8

United States exports of processed fish and shellfish in August 1960 were higher by 9.2 percent in quantity and 50.0 percent in value as compared with July 1960. Compared with the same month in 1959, the exports this August were lower by 50.0 percent in quantity and 6.2 percent in value. The lower exports in August this year as compared with the same month in 1959 were due mainly to the much lower exports of California sardines. Exports of high value fishery products, such as canned shrimp and both canned and frozen salmon, were higher this August than the same month of 1959.

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA:

The quantity of tuna canned in brine which may be imported into the United States dur-

ing the calendar year 1960 at the 12½-percent rate of duty is 53,448,330 pounds. Any imports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-October 1, 1960, amounted to 37,708,987 pounds, according to data compiled by the Bureau of Customs.



U. S. Production of Fish Sticks and Portions, July-September 1960

The United States production of fish sticks during the third quarter of 1960 amounted to 13.9 million pounds, while the production of fish portions totaled 12.0 million pounds. This was a gain in production of 7 percent for fish sticks and 40 percent for portions as compared with the same quarter of 1959. Most of the increase in fish-stick production occurred in cooked sticks (up almost 1.0 million pounds). The increase in portions was attributed to a greater production of raw breaded portions (up 2.5 million pounds).

Month	Produced (1,000 Lbs.)		Total
	Cooked	Uncooked	
July	3,454	317	3,771
August	4,553	393	4,946
September	4,733	479	5,212
Total 3rd quarter 1960	12,740	1,189	13,929
Total 3rd quarter 1959	11,789	1,209	12,998
Total first 9 months 1960	43,344	3,392	46,736
Total first 9 months 1959	41,132	3,746	44,878

^{1/}Preliminary.

Month	Breaded		Un-breaded	Total	
	Cooked	Un-cooked			
	(1,000 Lbs.)				
July	518	3,399	3,917	185	4,102
August	556	2,770	3,326	127	3,453
September	859	3,318	4,177	270	4,447
Total 3rd quarter 1960	1,933	9,487	11,420	582	12,002
Total 3rd quarter 1959	1,095	7,000	8,095	486	8,581
Total first 9 months 1960	5,318	27,509	32,827	1,410	34,237
Total first 9 months 1959	3,722	20,514	24,236	1,852	26,088

^{1/}Preliminary.

Cooked fish sticks (12.7 million pounds) made up 91 percent of the fish stick total. The remaining 9 percent consisted of raw fish sticks. A total of 11.4 million pounds of breaded fish portions (of which 9.5 million pounds were raw) and 582,000 pounds of un-breaded (raw) portions was processed during the third quarter of 1960.

The Atlantic Coast was the principal area in the production of fish sticks and portions with a total of 18.8 million pounds. The remaining 7.1 million pounds of sticks and portions were packed in inland, Gulf, and Pacific Coast States.

Table 3 - U. S. Production of Fish Sticks by Areas, July-September 1960 and 1959

Area	1960 ^{1/}		1959 ^{2/}	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	22	11,447	24	10,812
Inland and Gulf States	4	1,277	6	1,213
Pacific Coast States	8	1,205	10	973
Total	34	13,929	40	12,998

^{1/}Preliminary.

^{2/}Revised.

Table 4 - U. S. Production of Fish Portions by Areas, July-September 1959 and 1960

Area	1960 ^{1/}		1959 ^{2/}	
	No. of Firms	1,000 Lbs.	No. of Firms	1,000 Lbs.
Atlantic Coast States	20	7,363	23	4,351
Inland and Gulf States	6	4,433	8	4,093
Pacific Coast States	5	206	4	137
Total	31	12,002	35	8,581

^{1/}Preliminary.

^{2/}Revised.

Table 5 - U. S. Production of Fish Sticks by Months, 1956-1960

Month	1960 ^{1/}	1959 ^{2/}	1958 ^{2/}	1957	1956
	(1,000 Lbs.)				
January . . .	5,503	6,265	5,471	4,261	4,862
February . . .	6,534	6,340	5,925	5,246	5,323
March . . .	7,836	5,594	5,526	5,147	6,082
April . . .	4,867	4,708	4,855	4,492	3,771
May . . .	3,706	4,398	4,229	3,380	3,873
June . . .	4,361	4,575	4,702	3,522	3,580
July . . .	3,771	3,783	4,574	3,821	3,153
August . . .	4,946	3,872	4,358	4,643	4,166
September . . .	5,212	5,343	5,328	4,861	4,085
October . . .	-	5,831	5,485	5,162	5,063
November . . .	-	4,822	5,091	4,579	4,583
December . . .	-	4,734	5,467	4,014	4,019
Total . . .	-	60,265	61,011	53,128	52,562

^{1/}Preliminary (includes revisions for first six months).

^{2/}Revised.

Table 6 - U. S. Production of Fish Portions by Months, 1958-1960

Month	1960 ^{1/}	1959 ^{2/}	1958
	(1,000 Lbs.)		
January	3,620	2,692	1,973
February	3,451	3,025	1,254
March	4,615	3,225	1,471
April	3,415	2,634	2,268
May	3,196	2,684	1,478
June	3,938	3,247	1,504
July	4,102	2,227	2,161
August	3,453	2,796	1,516
September	4,447	3,558	1,566
October	-	4,314	2,560
November	-	3,483	1,979
December	-	3,262	2,060
Total	-	37,147	21,790

^{1/}Preliminary (includes revisions for first six months).

^{2/}Revised.

During the first nine months of 1960, a total of 46.7 million pounds of fish sticks was produced--an increase of 4 percent compared with the corresponding period of the previous year. Fish portions (34.2 million pounds) were 31 percent greater than the nine-months period of 1959.

Note: See Commercial Fisheries Review, September 1960 p. 33.



Wholesale Prices, October 1960

The mid-October 1960 wholesale price index for edible fishery products (fresh, frozen, and canned) at 129.4 percent of the 1947-49 average was up slightly (1.0 percent) from the preceding month and up 6.9 percent from the same month of 1959. From September to October, higher prices for fresh large haddock, oysters, frozen fillets, frozen shrimp, and canned fish were just about balanced out by lower prices for fresh haddock fillets, fresh shrimp, frozen halibut, and the fresh-water varieties. Wholesale prices in October 1960 increased over October 1959, due mainly to higher prices for fresh and frozen shrimp, oysters, fresh large haddock, frozen salmon, and canned fish. These increases more than offset lower wholesale prices for fresh and frozen haddock fillets, fresh-water whitefish and yellow pike, and frozen halibut.

The wholesale price index for the drawn, dressed, and whole finfish subgroup in October declined 2.0 percent from the preceding month. Normal price declines for fresh-water whitefish and yellow pike at New York following the Jewish holidays, plus a slight drop (1.0 percent) in the frozen dressed halibut price and a drop of 4.0 percent in salmon prices (due to change-over from fresh to frozen pricing) accounted for the change. An increase of about 2 cents a pound (17.5 percent) in large haddock prices at Boston partially compensated for the decline. From October 1959 to this October, the wholesale price index increased 8.2 percent, due to higher large haddock prices (up 10.6 percent) and frozen dressed salmon prices (up 14.1 percent). These increases were offset in part by lower prices for fresh-water whitefish and yellow pike, and frozen dressed halibut (down 4.2 percent).

The fresh processed fish and shellfish subgroup wholesale price index in October declined 1.2 percent from September. A

slight drop (1 cent a pound) in the small haddock fillet price at Boston plus a sharper drop of about 10.0 percent in fresh shrimp prices at New York more than offset a 7.2-percent higher shucked oyster price at Norfolk, Va. However, from October 1959 to October 1960, the subgroup price index rose by 5.0 percent due to a higher (11.1 percent) oyster price and a 4.1-percent increase in the fresh shrimp price. These increases were partly offset by a sharply lower price (28.2 percent) for fresh small haddock fillets.

In mid-October 1960 the wholesale price index for the frozen processed fish and shellfish subgroup rose by 5.1 percent as compared with September. A jump of about 5 cents a pound or 7.2 percent in the frozen 26-30 count shrimp price at Chicago plus increases of $\frac{1}{2}$ -1 cent a pound in the frozen

fillet items (due in part to healthier inventories) were responsible for the increase. From October a year ago to October 1960 the subgroup price index increased 8.7 percent. Frozen shrimp prices were up sharply (19.8 percent). This, plus less pronounced increases of 3.7 percent in ocean perch and 2.6 percent in flounder fillet prices, more than offset a drop of 10.8 percent in the frozen small haddock fillet price.

The canned fish subgroup price index continued to inch upward in October as compared with the preceding month and the same month of 1959 due mainly to short supplies of canned pink salmon. The October 1960 index for canned fish at 109.6 percent of the 1947-49 average was up 2.9 percent from September and 5.6 percent above October 1959. In October 1960 the canned pink salmon price

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, October 1960 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/		Indexes			
			(\$)		(1947-49=100)			
			Oct. 1960	Sept. 1960	Oct. 1960	Sept. 1960	Aug. 1960	Oct. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					129.4	128.1	124.4	121.1
Fresh & Frozen Fishery Products:					143.7	143.7	138.5	134.0
Drawn, Dressed, or Whole Finfish:					166.4	169.8	158.1	153.8
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.14	.12	141.5	120.4	88.9	127.9
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.31	.31	94.4	95.4	109.9	98.5
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.90	.94	202.2	210.6	202.2	177.2
Whitefish, L., Superior, drawn, fresh	Chicago	lb.	.74	.74	183.5	183.5	158.7	185.9
Whitefish, L., Erie pound or gill net, rnd., fresh	New York	lb.	.74	1.00	149.7	202.3	149.7	202.3
Yellow pike, L., Michigan & Huron, rnd., fresh	New York	lb.	.58	.77	134.8	179.4	170.0	161.8
Processed, Fresh (Fish & Shellfish):					135.3	137.0	131.6	128.9
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.31	.32	103.8	108.9	90.2	144.6
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.65	.72	102.7	114.1	106.6	98.7
Oysters, shucked, standards	Norfolk	gal.	7.50	7.00	185.6	173.2	173.2	167.1
Processed, Frozen (Fish & Shellfish):					115.7	110.1	112.6	106.4
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	102.1	100.8	102.1	99.5
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.29	.28	91.0	87.9	84.8	102.0
Ocean perch, skins on, 1-lb. pkg.	Boston	lb.	.28	.27	112.8	108.7	108.7	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.74	.69	114.2	106.5	111.5	95.3
Canned Fishery Products:					109.6	106.5	104.8	103.4
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	27.00	25.50	140.9	133.0	127.8	127.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.10	11.10	80.0	80.0	80.0	77.9
Sardines, Calif., tom, pack, No. 1 oval (15 oz.), 48 cans/cs.	Los Angeles	cs.	7.75	7.65	91.0	89.8	89.9	88.1
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.75	8.75	93.1	93.1	93.1	93.1

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.

rose \$1.50 a case or 5.9 percent from the preceding month and was 10.3 percent (\$2.50 a case) above October a year earlier. Other items in the canned fish subgroup were about unchanged in October 1960 from a month earlier and either unchanged (Maine sardines) or slightly higher for California sardines (up 3.3 percent) and light meat tuna (up 2.3 percent). The packing season for Maine sardines was about over at the end of October with a pack up moderately from the 1959 season. The catch and pack of southern California sardines for the first two months of the September 1-December 31 season were extremely poor. The California pack of canned tuna, although very good, was falling 1-2 percent behind the good pack of 1959 as October 1960 ended.



American Samoa |

TUNA LANDINGS, SEPTEMBER 1960:

In September 1960, tuna receipts at the tuna cannery in American Samoa amounted

American Samoa Tuna Landings, September 1960

Species	September		January-September	
	1960	1959	1960	1959
	(1,000 Lbs.)			
Albacore . . .	2,356	2,077	17,450	15,284
Yellowfin . . .	130	322	1,991	3,431
Big-eyed . . .	10	63	1,165	748
Skipjack . . .	-	-	10	4
Total . . .	2,496	2,462	20,616	19,467

Note: Majority of the tuna was landed by Japanese long-line vessels; a small amount was landed by a South Korean long-line vessel.

to about 2.5 million pounds, or close to 1.4 percent above the landings in August. Landings for January-September 1960 of 20.6 million pounds were up 5.9 percent from the 19.5 million pounds landed during the first nine months of 1959.



Whiting

FISH HELD IN REFRIGERATED SEA WATER STAYS FRESH LONGER:

Applied research on methods of extending the storage life of fresh dressed whiting while being held for processing has been completed by the Gloucester Technological Laboratory of the U. S. Bureau of Commercial Fisheries. With the completion of organoleptic tests and proximate analyses of whiting held in refrigerated sea water and in crushed ice, commercial-scale experiments are to be carried out in a fish plant in Rhode Island. A 3,000-pound-capacity refrigerated sea-water unit has been installed in the plant to conduct the tests in the near future.

Results of the laboratory experiments have shown that fresh dressed whiting stored in refrigerated sea water are of good quality after 11 days of storage. In contrast, fresh whiting stored in ice (similar to the usual commercial practice of storage before processing) are of good quality only up to 7 days and are of only fair quality after 11 days.



DEEPEST OCEAN DIVE

The recorded depth reported in under this title in the August 1960 issue (p. 13) of the Commercial Fisheries Review was based on preliminary data. Later studies of the data revealed that the bathyscaph Trieste, operated by the United States Navy Electronics Laboratory, dived 35,805 feet to the bottom of the Challenger Deep in the Marianas Trench, in the Pacific, on January 23, 1960. At that time a preliminary figure, for the depth of the dive, of 37,800 feet was released, but it was emphasized that it was an uncorrected figure.

During the first week of February, the depth gauge used on the deep dive was recalibrated at the Naval Weapons Plant at Washington, D. C. On the basis of this new calibration, the true depth of the Challenger Deep was recalculated from assumed density structure and gravity anomalies. Thus the latest depth computation of the dive is 35,805 feet. To this figure should be added the height of the pressure sensor above the bottom when the Trieste was at rest on the bottom. The greatest uncertainty in this figure of 35,805 feet is probably in the value adopted for gravity. The gauge reading may be considered reliable to ± 5 fathoms (± 30 feet).



FOREIGN

International

CONCURRENT OAS AND FAO
CONFERENCES ON AGRICULTURE

SIGNIFICANT FACTORS IN FISHERIES DEVELOPMENT:

Development of fisheries in Latin America was a topic of discussion at the Concurrent Organization of American States and the Food and Agriculture Organization Conferences on Agriculture in Mexico City, August 8-20, 1960. This was the Fifth OAS Conference on Agriculture and the Sixth FAO Regional Conference for Latin America.

The discussion of the development of fisheries revolved primarily around three proposals that had been submitted and which were approved. These were:

1. A Mexican proposal to encourage countries to establish agricultural fish-cultural services to convert inland waters into new sources of food supply.
2. A Mexican resolution recommending that the Governments pay more attention to fishery administration and research, to take into consideration the facilities of FAO and OAS, and that the Directors of FAO and OAS give the greatest possible attention to international conferences, seminars, and scholarships in the fishery sciences and especially to fishing administration.
3. A Panamanian recommendation to establish in Panama, in cooperation with other Governments of the region, a regional fishery institute to undertake studies, investigations, experiments, training, and extension in all branches of fisheries. This proposal asks the Director-General of FAO to assist the interested Governments in requesting money from the United Nations Special Fund for financing and for the preparation of plans for the institute.

EUROPEAN COMMON MARKET

EFFECTS OF EEC AND EFTA ON SCANDINAVIAN FISHERIES:

Speaking at the Nordic Fisheries Conference, held in Karlskrona, Sweden, August 16-18, 1960, the Danish Fisheries Ministry declared that development of the European Economic Community or Common Market (EEC) and the European Free Trade Association (EFTA) posed many new problems for the European fishing industry. However, he continued, the interests of the Scandinavian countries were so closely identified that they should be able to pursue the common policy necessary to insure satisfactory competitive conditions for their fisheries.

The Minister focussed his attention on marketing problems in the new European economic area organizations, while pointing out that combined fish exports from Denmark, Iceland, Norway, and Sweden during 1959 totaled about 100 million Danish kroner (US\$14.5 million) more to EFTA than to EEC customers. He listed as the principal problems: (1) the relationship of Finland and Iceland to the market formations; (2) a satisfactory solution within EFTA of the fresh fish question; and (3) the accommodation of Scandinavian export interests within EEC, where tariff and quota restrictions loom especially large and where, moreover, internal fishery policy has not yet been determined.

Without attempting to offer definitive solutions to these problems, he did point out that the expected general expansion of trade within EFTA should have a wholesome effect on the trade in fish products, regardless of whether or not tariffs are eliminated on fresh fish and related items. The direct advantages to be derived from the Stockholm Treaty, he continued, are that tariffs and quotas will be gradually removed for canned fish, frozen fillets, fish oil, fish meal, and fish solubles, always allowing for the possibility that this might backfire against Sweden and Denmark, to the added advantage of Norway. Denmark itself can expect a substantial increase in imports of canned fish, the only fish product on which a Danish duty is imposed at present. Portugal will probably supply a large portion of this increase, with higher grades of canned fish coming from Norway and Sweden, the latter especially furnishing herring in other than airtight containers.

With regard to opportunities afforded Scandinavian fisheries for expansion in EEC markets, the Minister asserted that there are powerful elements within the EEC countries striving for protectionism and self-sufficiency in fishery production. At the same time, however, there are circles within these countries which understand clearly the foolishness of such a policy and see the greater benefits of a common European fishing policy and free trade, such as have hitherto been striven for in negotiations within the Organization for European Economic Cooperation.

We must hope, he concluded, that the liberal forces will prove to be the most influential within EEC and will prevent the adoption of restrictive fishery policies. However, the EEC tariffs which will become effective on January 1, 1962, do not reflect a particularly liberal attitude but on the contrary contain certain duty increases which might have an appreciable effect on some exporting countries.

International (Contd.):

At the subsequent annual meeting in Copenhagen of the Danish Fish Trade and Ocean Fishery Association, the organization's president predicted that the formation of the EEC would force Danish fishermen to bear the cost of a heavy duty on fish exported to West Germany, thus cutting in to the fishermen's profits. He saw little hope for effecting a downward revision of the duty by bringing the matter before GATT.

Speaking at the same meeting, the Danish Fisheries Minister was less pessimistic about the ability of Danish fishermen to find profitable markets for their catches. And he asserted that the German marketing problem would not have been completely solved had Denmark refrained from joining the EFTA or even had she joined the EEC. (United States Embassy, Copenhagen, September 15, 1960.)

EUROPEAN FREE TRADE ASSOCIATION

IMPORT TARIFFS REDUCED:

On July 1, 1960, seven countries in Western Europe reduced by one-fifth their protective import duties on practically all the industrial products coming from each other.

At the same time insofar as these seven countries still limit imports from each other by "quota" or quantitative import restriction, these quotas are being relaxed to allow 20 percent more trade.

It is proposed that, by 1970 there will be free trade in the goods covered by the Convention of the European Free Trade Association. The full membership makes up a single market with a population of 90 million. The seven countries (Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom) are among the most important international traders, and these are interesting facts about them:

1. Three-fifths of their foreign business is outside Europe altogether. In the case of Britain 75 percent or more of her trade is outside Europe; 50 percent of her total trade is with her Commonwealth partners.
2. The seven countries do about a quarter of their business with the European six, or European Common Market countries (Germany being their main trading partner).

3. The seven countries enjoy a higher average standard of living than the rest of Europe.

The high living standards of the 90 million people in the EFTA have been established by the importation of goods; for these countries are not endowed by nature to be self-suffi-

cient. Their strength has been built up by buying and selling abroad.

The seven countries need foreign goods, and as they prosper through freer trade among themselves, the demand for imported goods will grow.

They are not likely to fall into a protective ring. They are pledged in GATT to consider the reciprocal reduction of tariffs on a world-wide basis. They are ready to find common cause with the other European group--the European Economic Community--in a United Europe, if terms acceptable to both groups can be negotiated.

In the meantime EFTA is going ahead--reducing barriers to trade between its members. (British Affairs, September 1960.)

Note: See Commercial Fisheries Review, July 1960 p. 47.

FISHING LIMITS

ICELAND-UNITED KINGDOM NEGOTIATE ON FISHING LIMITS:

The Icelandic Ministry for Foreign Affairs announced September 21, 1960, that talks with the United Kingdom on the two-year-old dispute over the Icelandic 12-mile fishing limit were due to open in Reykjavik October 1.

Both Icelandic opposition newspapers greeted the announcement with alarm and predicted disaster. Both papers called for popular manifestations against compromise of the 12-mile limit.

In September, 79 British trawlers were reported to be operating in waters adjacent to Iceland, but outside the 12-mile limit in accordance with the truce being observed by the British fishing industry. (United States Embassy, Reykjavik, September 22, 1960.)

BRITAIN AGREES TO RECOGNIZE NORWAY'S FISHING LIMITS:

Britain and Norway on September 29, 1960, announced that they had agreed that British trawlers may fish up to six miles of Norway for the next ten years (ending October 31, 1970), but after that must keep at least 12 miles off the Norwegian coast.

The agreement was concluded in Oslo, but it must be ratified by the Parliaments of

International (Contd.):

both countries before it becomes final. Until ratification, British trawlers will continue to fish up to 4 miles of the Norwegian coast. The agreement is a compromise between Norway's claim to territorial and fishing limits of 12 miles (from which all foreign trawlers would be excluded) and Britain's refusal to recognize the claim.

Also, the agreement covers the registration and identification of vessels, the marking of fishing gear, and the regulation of fisheries as between different types of vessels. It provides for both parties not to fish in specified areas in certain seasons. The purpose of the rules is to avoid interference with fishing and damage to fishing gear. Rules will apply to the waters off Norway in which United Kingdom and Norwegian vessels are fishing, including the 6-12 mile zone during the transitional period.

Traditionally, the British government has never recognized the right of any other state to prohibit fishing beyond a three-mile limit. Norway was the only country which Britain had conceded could move the fishing limits to four miles.

Under the new agreement, British vessels will be able to fish between six and 12 miles off the Norwegian coast until October 31, 1970. After that, the British trawlers will be barred inside 12 miles of Norway's shore.

Four limited areas in the 6- to 12-mile belt will be prohibited to fishing vessels of either Britain or Norway in certain seasons.

The Anglo-Norwegian fishery negotiations took place in Oslo from September 22-28, 1960, and ended successfully.

In reaching this agreement, both sides have had in mind the importance of resolving on a practical basis the problems which will arise in the light of Norway's declared intention to extend the fishing limits around its coasts, and of reconciling, to the greatest possible extent, the interests of the fishing industries of both countries that good relations may be maintained. With this aim it was agreed that as far as possible the agreement should be based on the proposal put forward jointly by the Governments of the United States and Canada at the second United Nations Conference on the Law of the Sea in 1960 and which obtained 54 votes, including those of the United Kingdom and Norwegian Governments.

The enforcement of the rules will be a matter for the fishery protection vessels of both countries acting in cooperation and cases of infringement will be a matter for the flag countries of the vessels concerned to prosecute in their own courts. It has, however, also been agreed that in the 6-12 mile zone during the transitional period, the regulation of the fisheries shall be a matter for the Norwegian fishery protection vessels only, and although they will have no power to arrest United Kingdom vessels, they will be able to collect evidence of any infringements and report them to the United Kingdom authorities.

As soon as acceptance by the respective Governments has been obtained, the agreement will be signed, subject to approval by the United Kingdom Parliament and the Norwegian Storting, as soon as possible. (United States Embassy in London, September 30, 1960.)

FOOD AND AGRICULTURE ORGANIZATION

MEETING ON FISHERIES
CREDIT HELD IN PARIS:

Participants from 30 nations attended Food and Agriculture Organization (FAO)-sponsored technical meeting on credit for fishery industries, held in Paris, France, from October 17-22. The meeting was open to all FAO member countries.

More than 60 participants, representing nations as globally diverse as Japan and Peru, considered some 34 papers prepared for the meeting.

The meeting was designed to provide an exchange of views on the solution of problems in the organization and day-to-day administration of government credit programs for fisheries. Special attention was paid to conditions in underdeveloped countries and to how experience gained elsewhere can be usefully applied in organizing credit services in those countries.

The Secretary of the Conference pointed out that the exceptional risks connected with the production and distribution of fish have made it difficult for the industry to obtain private credit on acceptable terms. While the purpose of the meeting was not to discuss whether or not governments should or should not assist fishery industries through extending credit, he said much could be gained by joint study of existing credit policies and operations.

The agenda included the following principal subjects:

1. Objectives of credit policy in developed countries and their implications for the general character of credit assistance.
2. Objectives of credit policy in underdeveloped countries and their implications for the general character of credit assistance.
3. Organizational aspects of fisheries credit schemes.

International (Contd.):

4. Operational aspects of fisheries credit schemes.

5. Coordination, review, and appraisal of credit policies.

A list of the papers presented follows:

Sources of Loan Funds for Cooperatives, by FAO Secretariat, based on a study by Miss M. Digby, Secretary, The Plunkett Foundation for Cooperative Studies, FAO Consultant. FIFA/WP/1, in English, French and Spanish.

Government Credit Schemes for Fishery Industries in the Indo-Pacific Region, by FAO Secretariat. FIFA/WP/2, in English, French, and Spanish.

Organization and Management of Credit Cooperatives, by FAO Secretariat, based on a study by Miss M. Digby, Secretary, The Plunkett Foundation for Co-operative Studies, FAO Consultant. FIFA/WP/3, in English, French, and Spanish.

Government Credit Facilities for Fishermen in Madras State, by P. I. Chacko, Deputy Director of Fisheries, Madras State, India. FIFA/WP/4, in English.

Le Régime des Bonifications d'Intérêt en faveur de l'Armement et Le Crédit maritime mutuel en France, notices présentées par la Direction des Pêches maritimes, Marine marchande, Paris. FIFA/WP/5, in French.

Le Crédit à l'intention des Industries des Pêches dans la République togolaise, Commentaires sur l'Ordre du Jour par M. R. Desport, Vétérinaire-Inspecteur, Service de l'Élevage et des Industries Animales, Lomé. FIFA/WP/6, in French.

Sources of Credit for Fishery Industries in Denmark, by B. Dinesen, Fisheries Secretary and Chairman of the Board of the Royal Danish Fisheries Bank, Copenhagen. FIFA/WP/7, in English.

Government Credit Facilities for Fishermen in Bombay State, Comments on the FAO Draft Agenda by C. V. Kulkarni, Director of Fisheries, Bombay, India. FIFA/WP/8, in English.

Credit Facilities for the British Herring Industry, by H. H. Goodwin, General Manager, Herring Industry Board, Edinburgh. FIFA/WP/9, in English.

Note on Fishery Credit Schemes in West Bengal, by K. C. Saha, Director of Fisheries, West Bengal, India. FIFA/WP/10, in English.

Le Crédit à l'intention des Industries des Pêches au Portugal, Projet de Réponse aux Questions à l'Ordre du Jour, par le Capitaine de Frégate Renato Sequeira de Brito, Cabinet de Estudos das Pescas, Lisbonne. FIFA/WP/11, in French.

Government Financing of the Fishing Industry in the United States of America, by C. Eldred Peterson, Chief, Branch of Loans and Grants, Bureau of Commercial Fisheries, U. S. Department of the Interior. FIFA/WP/12, in English.

Le Crédit dans la Pêche belge, par P. Hovart, Secrétaire du Conseil professionnel de la Pêche, Ostende. FIFA/WP/13, in French.

An Examination of Arguments for Special Credit Policies for Fishing Industries, by J. Wiseman, London School of Economics and Political Science, FAO Consultant. FIFA/WP/14, in English, French, and Spanish.

Credit Assistance for the Promotion of Fish Marketing in the Federal Republic of Germany, by Dr. Hans Wilhelm Kurjo, Secretary of the Förderungsdienst für den Fischabsatz G.m.b.H., Bremerhaven. FIFA/WP/15, in English.

The Structure of Fisheries Finance in Japan, by Konei Teshima, Data and Statistics Section, Fisheries Agency, Tokyo. FIFA/WP/16, in English.

Credit for Fishery Industries in the Netherlands, by Drs. G. J. Lienesch, Director of Fisheries, Ministry of Agriculture and Fisheries, The Hague. FIFA/WP/17, in English.

The Fisheries Development Corporation of South Africa Limited, Its Establishment, Functions and Operations, by Cecil von Bonde, General Manager, and W. H. Stoops, Secretary. FIFA/WP/18, in English.

The Economic and Social Effects of Public Credit in the Fishing Industry of Jamaica, by A. J. Thomas, Fisheries Officer, FIFA/WP/19, in English.

Le Crédit destiné aux industries des Pêches belges, par R. H. M. de Graef, Secrétaire d'Administration, Administration de la Marine et de la Navigation Intérieure, Belgique. FIFA/WP/20, in French.

Proyecto para la administración de un fondo de empréstitos destinado a la concesión de créditos para pequeños pescadores, presentado por el Banco Central del Ecuador. FIFA/WP/21, in Spanish.

Reglamentaciones vigentes relacionadas con el otorgamiento de créditos para la industria pesquera por parte del Banco Industrial de la República Argentina, y del Banco de la Nación Argentina, presentado por la Dirección General de Pesca de la República Argentina. FIFA/WP/22, in Spanish.

Organization of Credit and Finance in the Fish Industry of the Federal Republic of Germany. FIFA/WP/23, in English.

Pilot Experiment in Changing the Mode of Credit in a Marine Fishing Village, by G. N. Mitra, Director of Fisheries, Orissa, India. FIFA/WP/24, in English.

The Provision of Credit to Fishermen in Uganda, by A. D. Grimmer, Assistant General Manager, Uganda Credit and Savings Bank, Kampala. FIFA/WP/25, in English.

Fishery Credit in Japan, by Shinkichi Katayanagi, President, National Federation of Fisheries Cooperative Associations, Tokyo. FIFA/WP/26, in English.

Economic Information needed for Fishery Loan Policy Considerations, by Walter H. Stolling, Chief, Branch of Economics, Division of Industrial Research, Bureau of Commercial Fisheries, Fish and Wildlife Service, United States Department of the Interior. FIFA/WP/27, in English.

Small Boat and Gear Insurance for Canadian Fishermen, by I. S. McArthur, Chief Administrator, Fishermen's Indemnity Fund, Department of Fisheries, Ottawa, Canada. FIFA/WP/28, in English, French, and Spanish.

International (Contd.):

Institutional Lending to the Icelandic Fish Industries, by Gudmundur B. Olafsson, Chief of Administration, Iceland Bank of Development. FIFA/WP/29, in English.

A Fishery-Economist's View on Public Credit for Fishery Industries, by A. G. U. Hildebrandt, ec.drs., Chief Fisheries Division of the Agricultural Economics Research Institute, The Hague, Holland. FIFA/WP/30, in English.

Credit Aid for the British White Fish Industry, by E. S. Holliman, Assistant Chief Executive, White Fish Authority, London. FIFA/WP/31, in English.

The Operation and Administration of Credit Schemes in the British White Fish Industry, by E. S. Holliman, Assistant Chief Executive, White Fish Authority, London. FIFA/WP/32, in English.

Statistical and Economic Review of the Credit Aid Schemes in the White Fish Industry in Great Britain, by E. S. Holliman, Assistant Chief Executive, White Fish Authority, London. FIFA/WP/33, in English.

Finance to the Fishery-Industry in the Netherlands, by Drs. R. G. E. Vissers, National Herstel Bank, The Hague. FIFA/WP/34, in English.

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PLAN TO STANDARDIZE NAMES OF MEDITERRANEAN FISH:

The first attempt to standardize the names of fish in order to make fishery statistics comparable among Mediterranean countries has been undertaken, in the form of an illustrated draft catalogue issued by the Food and Agriculture Organization (FAO). The catalogue, containing the names of fish of commercial importance in the Mediterranean, was distributed to members of the General Fisheries Council for the Mediterranean (GFCM) when the council met in Rome, September 22-28, 1960.

The book contains sketches of 250 fish, with their chief characteristics, species, order, and family. Wherever possible the fish's common name has been given in each of the languages of the 12 GFCM member nations.

The need for a catalogue became evident when Mediterranean fisheries experts found they had difficulty in interpreting national statistics for publication, since the same fish was often designated under different names. Some fish were not named at all. This made the assessment of catches and their commercial value extremely difficult.

For instance, the sturgeon is simply known as "sturgeon" in English and is untitled or may be known by a multiplicity of names in Egypt, Israel, Tunisia, and Turkey, as far as FAO's Fisheries Division can determine. The name of a particular type of sole exists in Italian, but is unavailable in the languages of the other 11 Mediterranean nations, although the fish probably exists in the waters off these countries.

The catalogue lists all fish of commercial importance in the Mediterranean--such as the sea horse--

and not just fish that are edible. The sea horse is currently in vogue for use in costume jewelry.

Fish such as herring, cod, haddock, coalfish, and halibut, not caught in the Mediterranean but found in Mediterranean markets, are listed separately in the catalogue. Eighteen kinds of rays, beginning with the guitarfish and ending with the devilfish, are listed. Twenty-eight types of sharks, from the "Darkie Charlie" to the six-gilled shark, are depicted in the book.

The catalogue is so bound that its pages may be removed and filed according to the language classification of each Mediterranean country.

GENERAL FISHERIES COUNCIL FOR THE MEDITERRANEAN

TWO NEW FISHERY PROJECTS URGED BY COUNCIL:

Two projects requiring special financial support by member countries and calling for studies by the Food and Agriculture Organization (FAO) were recommended on September 26, 1960, by the utilization committee of the General Fisheries Council for the Mediterranean (GFCM). The committee's recommendations, which were subject to approval by the GFCM at its plenary session on September 28, 1960, deal with standardizing fish packing and tuna preservation.

The group said that it is extremely advisable to standardize fish packing in all of the 12 GFCM member countries. It suggested that FAO undertake a study on the international standardization of fish packing, based on a limited number of boxes with specific dimensions and built for a specific species of fish. The member countries would contribute to the study by making their experts available and by special financial support.

It was also suggested that FAO begin a study of tuna preservation using the GFCM country that offers the best possibilities for the study. The investigation would deal with both the supply of raw material and with manufacturing. The other member countries would supply data to aid the experiments and also contribute special financial support.

In outlining part of the program for the GFCM's Seventh Session, to be held two years hence, the utilization committee drew the attention of the Council members to developing fish-meal production for human consumption. It also suggested standardizing the process of manufacturing semipreserved fish with special regard to the European Common Market.

International (Contd.):

The recommendations of the utilization committee, as well as recommendations from the four other GFCM committees, will be used by the GFCM to draw up its program of work for 1960-62.

Delegates present at the Sixth Session of the GFCM represented Spain, France, Monaco, Italy, Yugoslavia, Greece, Turkey, Tunisia, Morocco, Israel, and the United Kingdom (Malta), plus an observer from Libya and observers from nine international organizations.

* * * * *

CANNING AND MIGRATION STUDIES OF MEDITERRANEAN TUNA PLANNED FOR 1961-62:

An international attempt to improve the tagging and canning of Mediterranean tuna has been mapped out for action by the General Fisheries Council for the Mediterranean (GFCM) during the next two years.

The Council, after ending its sixth session held in Rome at the Food and Agriculture Organization (FAO) headquarters, adopted recommendations and resolutions put forward by its five working committees. Among them were resolutions calling for joint action in the field of tagging tuna, an oceanographic survey of the eastern part of the Mediterranean Sea, and a study by FAO of technical problems related to canning tuna.

The Council secretary said that the wealth of tuna known to inhabit the area is likely to provide a great deal more food fish for the consumer and more income for the producer if there is a concerted effort towards rational exploitation.

The program would involve financial support from the GFCM member countries, and participation of the members in providing data necessary to proceed with experiments and research; one country would be chosen as the site of the canning studies.

The tuna program was part of the 1961-62 work schedule adopted by the Council. Also included were several projects to be undertaken with FAO assistance and with special financial support from GFCM member countries.

The Council voted to undertake tagging tuna in the Mediterranean in cooperation with an FAO world meeting on tuna and related species to be held in 1962. Council members would circulate information on their tagging programs and return tags to all institutes involved in the program. It agreed to establish an over-all research program on tuna, based on oceanographical and biological information.

The Council also asked for the assistance of FAO's Fisheries Division in testing and introducing new techniques for finding and catching fish and in standardizing fish packing. These programs would require assistance by experts from the member countries plus special financial support.

The group voted to draw up a catalog of names of molluscs and crustaceans found in the Mediterranean and a catalog listing freshwater fish found in the Mediterranean area.

GREAT LAKES FISHERIES COMMISSION

CANADA APPOINTS NEW COMMISSIONER:

The Canadian Minister of Fisheries has announced the appointment of Dr. J. R. Dymond as one of the Canadian Commissioners administering the Great Lakes Fisheries Treaty.

Dr. Dymond's appointment was made to fill the vacancy caused by the death of Dr. Harkness.

INTERNATIONAL ASSOCIATION OF FISH MEAL MANUFACTURERS

INDUSTRY PROBLEMS OUTLINED AT PARIS CONFERENCE:

The President of the International Association of Fish Meal Manufacturers, speaking at the first annual conference held in Paris, France, September 27-30, 1960, outlined some of the problems facing the fish-meal and oil industry. He stated:

"The outstanding problem which has produced a crisis in the industry in many countries is the fall in world prices due to overproduction and this transcends in importance any other problem, because without prosperity no section of the industry can function properly. In particular is this so with regard to scientific research where progress in techniques and improvements can be seriously affected.

"Everyone here knows what has happened. There is no need to elaborate on it and we are all wondering what is going to happen next.

"Whole industries have ceased functioning, with all the effects that this has had on ancillary industries such as boat building, engineering, ice factories, transport, etc., with the result of unemployment and personal hardship as well as financial loss.

"All fish meal producers have been seriously affected-- some of those who fish for fish meal find themselves unable

International (Contd.):

to pay the fishermen their usual prices for fish and some have had to reduce prices or cut production altogether. Those countries who use fish offal almost entirely have had to reduce their prices to the fish trade so that in both cases the fishing industry of the country is affected.

"The majority of countries have, however, experienced bad times in the past and they have sufficient financial resources by way of reserves or because of the general prosperity of the fishing industry in their country to weather this storm. Obviously the countries who depend solely on offal will continue to produce. The fishing trade of their countries must give them the offal even if necessary without payment.

"It is not impossible to suppose that the governments concerned will cease to remain passive in the light of the threat to the prosperity of these basic industries and will take steps to give protection.

"Discussions among the fish-meal producing countries, so that each can have a fuller appreciation of the others problems will be of considerable value. The whole subject is so complex and in a condition of continual change that it cannot be otherwise than useful to have all the information available.

"For a moment let me remind you of some of the conditions which have led to the present state of the market:-

"The sudden extraordinary rise in production without a corresponding increase in demand.

"Accumulation of stocks.

"Inefficient marketing, i.e. lack of a well-thought-out system of distribution and marketing designed to protect both producers and buyers.

"Substantial quantities of fish meal being produced of poor quality.

"Reports in certain cases that contracts are not being properly fulfilled, with the result that buyers are involved in heavy losses and with the resulting lack of confidence in future business.

"Continued price cutting, the result of overproduction and excessive competition.

"Speculation by large and small people, which has been the cause of heavy losses.

"With regard to overproduction there is no magic formula for the industry or for any of our countries which will put things right. Personally, I feel that each country must endeavor to work out its own solution and it may be that eventually some sort of plan may be evolved on which the association can take a hand, but one thing that we cannot do is to interfere unasked in any country's business affairs. All that we can say is that amongst the members of this association there is considerable experience, which is at the service of the entire industry.

"I would suggest consideration of two things:-

"1. Improvement in standard of quality.

"2. Consideration of some form of International Contract.

"With regard to the first, quality is of the utmost importance to the farmer and compounder. Only a very small percentage of the ration is supplied by fish meal and buyers will not grudge a reasonable premium for quality.

"If, therefore, we can give the buyer any additional guarantee to the usual chemical analysis of protein, oil and minerals, then we should do so. I am thinking principally of digestibility.

"I would like to ask our scientific advisors how far they think we can go in giving additional guarantees and I suggest that manufacturers should concentrate on producing a top-grade fish meal on which buyers could rely for quality and manufacturers should take all steps possible to see that second-grade fish meals do not compete with first grade, but are segregated for other uses or carefully marketed where they would not affect the marketing of top-grade quality fish meal.

"With regard to consideration of some form of international contract, if it were possible to have one form of contract only, I feel that it would help marketing and help stability of prices, but I do not mean to imply doubts on old established contracts such as are used today. I did, however, refer previously to lack of confidence because of the losses which were caused by bad performance of contracts and it is this that I have in mind in suggesting that something be done to tighten up contracts, so that buyers can place more reliance on them.

"I feel that this Association should have all the support which manufacturers throughout the world can give it. . . ." (Fisheries Council of Canada, *Bulletin*, October 3, 1960.)

INTERNATIONAL CONFERENCE ON FISH IN NUTRITION

UNITED STATES FISHING INDUSTRY
PLEDGES SUPPORT TO CONFERENCE:

Various segments of the United States commercial fishing industry, meeting in Washington, D. C., have pledged their support in making the coming world nutritional fishery conference a success, the U. S. Department of the Interior reported on October 19, 1960.

The conference will be held in Washington, D. C., September 19-27, 1961, under the auspices of the Food and Agriculture Organization (FAO). It will be officially known as the International Conference on Fish in Nutrition. About 400 representatives from more than 50 nations are expected to attend.

A suggested agenda for the conference is being prepared by the Food and Agriculture Organization. Speakers will include some of the world's leading scientists in this field. Numerous other arrangements for the meeting will be handled by the U. S. Bureau of Commercial Fisheries.

Initial steps for the conference were taken last year when the United States delegation to the Tenth Food and Agriculture Organization Conference in Rome urged the calling of such a meeting. The State Department accepted the invitation of the FAO for the United States to be the host country.

The fundamental purpose of the meeting is to assemble the scattered information on the nutritive value of fish, to assess this information, and to stimulate future scientific investigation on this food source.

One result would be to delineate the role of fish and fishery products in adding to the supply of protein foods in both developed and underdeveloped areas of the world.

Other objectives are to stimulate international exchange of information pertaining to fish as a food and to prevent needless duplication of research; to provide the basis for future conferences on more specific aspects of the nutritional value of fishery products; to provide technical and economic information on available marine food resources to combat present world-wide nutritional deficiencies and to meet future expanded world food needs; to provide information on present world production and utilization of fishery products and to determine factors that may enhance the availability and utilization of these products.

The conference will consider the nutritive aspects of fish and fishery products both as they pertain to human needs and to use in animal feed. It will be a scientific meeting with scientists from many nations, drawn from the industry, educational institutions and government, presenting reports.

International (Contd.):

Main topics which are being considered include such things as the role of fish in world nutrition, the chemical composition of fish and fishery products, contribution of fish and fishery products to the diets of various nations; fishery products in animal nutrition; possibilities for increasing fish consumption.

Under such main titles would be reports on the amino acid composition of the protein in fishery products; fats, oils, and related components; food values of fresh fish compared with processed fishery products; minerals and vitamins in fish; incidence of malnutrition, by regions; fish in dietetics, including geriatric diets; utilization of fish flour; fish proteins and their importance in preventing malnutrition; fish derivatives in feed for swine, calves and poultry, and for fur bearing animals; economic and social incentives for increasing production; and methods of consumer education.

The Washington meeting of the representatives of several fishery organizations was called by the Bureau of Commercial Fisheries to acquaint the industry with current thinking on program and arrangements and to solicit suggestions and comments. The group expressed itself generally in favor of the proposed program and made several suggestions regarding it.

Bureau officials are working actively with interested groups in the United States to complete recommendations on the subject matter for the conference agenda. FAO will consider these recommendations, and those of the member nations, in preparing the final agenda. Once the agenda is firm, FAO will issue to the world's scientists, active in research that will further the use of fish as food, an invitation for them to offer reports on their work. These reports will be screened by an FAO scientific committee and those of pertinence and high scientific quality will be presented at the conference.

INTERNATIONAL COOPERATION ADMINISTRATION

SPONSORS STUDY OF MARINE RESOURCES OFF COASTS OF VIETNAM AND THAILAND:

A study of the marine resources in the Gulf of Thailand and the South China sea, waters which border many countries of Southeast Asia, is being sponsored by the U. S. International Cooperation Administration (ICA) in support of the interest of Thailand and Vietnam in learning more about the seas which border their coasts.

As a result of the ICA sponsorship, the Scripps Institution of Oceanography of the University of California and the George Vanderbilt Foundation at Stanford University have jointly undertaken a marine biological and oceanographic survey of this vast area. The term of the project is for a period of two years with the possibility that it might be extended for some additional period.

The investigations are being conducted by the Scripps research vessel Stranger, a 300-ton, twin screw, motor vessel. Near-shore investigations are being conducted along the Gulf coasts of Thailand and the sea coasts of

Vietnam from smaller boats provided by agencies of the two countries.

Highlights of the Naga Expedition, as it is called, were given in a speech by the Captain of the Stranger at an American Association Luncheon on July 20, 1960, in Bangkok.

A major reason for the project and the basis for its stated objectives is that although the seas adjacent to the borders of Thailand and Vietnam may well be one of their richest natural resources, adequate, systematic investigation and analysis of the scope required has never been accomplished. Principal stated objectives are directed toward but are not necessarily limited to: (a) providing information and scientific basis for the development of marine economic resources of Vietnam and of Thailand; (b) preparation of a well-documented collection of fishes, invertebrates, and marine plant life; (c) preparation of handbooks summarizing the features of marine fauna and ecology in the area and for the identification of marine species of known and potential commercial importance; (d) training of young marine scientists and technicians; (e) encouragement of the marine sciences in the general region; and (f) promotion of the exchange of scientific information in the marine sciences.

Each of these objectives is worthy of a full-scale supporting program, but the major effort should be directed towards carrying out the kind of basic studies which will lead to an understanding of the oceanography of the region, including the circulation, methods of enrichment, primary productivity, and of the nature, distribution, and abundance of the important marine resources. In accomplishing this, it is hoped to recognize and attack one or more specific problems, in the solution of which it is possible to demonstrate the practical application of scientific findings.

INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA

COLD-WATER FLOW FROM ARCTIC OCEAN INTO NORTHEAST ATLANTIC AFFECTS AREA'S FISHERIES:

Findings of "great value" to fishery research have resulted from the international expedition, completed in mid-1960, which set out to find the overspill of cold "heavy" water on the ridge between the Faroe Islands and Iceland.

International (Contd.):

A scientist from the Marine Laboratory, Torry, Aberdeen, who organized and led the expedition, stated on his return to Aberdeen last week that it was "a magnificent example of international cooperation."

Survey ships of five nations--Britain, Russia, Germany, Norway, and Iceland--took part in the three-weeks survey.

The head of the hydrographic section at Torry, used the Laboratory's research vessel Explorer as flagship, and the research ships of the nations kept in radio contact with each other during the three weeks.

The objective was to try to trace the overspill of cold "heavy" water from the deep Arctic into the Northeast Atlantic, which is believed to have highly important after-effects on Northwest European fisheries.

The idea was to carry out a survey on each of the three weeks so that the overspill might be traced and measured. The scientists would have felt that their efforts had been rewarded had they found the overspill but once.

Instead they located it on every occasion, and a great deal of valuable data was collected with instruments operated to the depth of 2,500 meters (8,200 feet).

This "overspill" is believed to affect the flow of nutrient salts in deep oceanic waters, these salts being fertilizers of the marine vegetation on which fish feed. White fish are dependent on this continental shelf for their food and the expedition was, therefore, concerned with the question of the fertilization of the region, which is about 200 miles wide.

"We made a survey three times, with a week's interval between," the British scientist stated.

He produced charts at a press conference to show how successful the scientists had been in gauging the extent and direction of the overspill.

The expedition was sponsored by the International Council for the Exploration of the Sea and the British scientist is chairman of the council's hydrographic committee.

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

SEVENTH ANNUAL MEETING IN BRITISH COLUMBIA:

The Seventh Annual Meeting of the International North Pacific Fisheries Commission was held in Vancouver, British Columbia. The Commission, composed of representatives from Canada, Japan, and the United States, held its formal opening session on November 7, 1960. The week-long plenary sessions of the Commission were preceded by three weeks of meetings of a number of scientific and technical committees.

The Commission, established in 1953, is responsible for developing solutions, on a scientific basis, for fishing problems which arise between the three countries in the high-seas areas of the North Pacific Ocean.

Under the terms of the North Pacific Treaty, Japan has abstained from fishing salmon, halibut, and herring along the North American coast. Canadian fishermen also abstain from fishing salmon of United States origin in the Bering Sea. In order for a stock of fish to qualify for continued abstention, it must be demonstrated that it is being fully and scientifically exploited and properly conserved by the countries which are allowed to continue to fish. The Commission is required to review the conditions for abstention each year and to determine whether or not the stocks in question continue to qualify. The abstention questions, with their broad background of research and scientific information, occupied a major part of the Commission's attention at this annual meeting.

The Commission also concerned itself with studies of the proper location for the dividing line for salmon fishing. At present Japan refrains from fishing for salmon east of a line which runs north and south along the 175th west meridian, some 2,000 miles west of Vancouver. An extensive research program has been carried out to discover whether or not this line most equitably divides salmon of Asian and North American origin.

At the present meeting, action on confirmation or adjustment of the dividing line depended in part on whether or not the Commission received from its sponsoring governments an agreed interpretation of the principles on which drawing of the line should be based. At

International (Contd.):

its 1959 meeting, held in Seattle, the Commission referred this question of Treaty interpretation back to the sponsoring governments and, at the present time, was still awaiting an agreed interpretation.

Strong emphasis was given to the task of analyzing and publishing the great volume of research material which has accumulated from the Commission's investigations on the high seas. These investigations, in which all three countries have taken part, have contributed a tremendous amount of information about the fisheries resources of an area that was largely unknown when the Commission began its work.

Preliminary committee meetings, participated in by many prominent fisheries scientists from each of the three countries, were held in Nanaimo during the week of October 17, at Harrison Hot Springs during the week of October 24, and in Vancouver during the week of October 31.

Four Commissioners represented each of the member nations. They were accompanied by staffs of advisors and experts, bringing the total number of participants in the meeting to approximately 100. Observers from a number of other international fisheries organizations and from the U. S. S. R. were expected to attend the sessions.

The United States delegation was led by Commissioner Milton E. Brooding of San Francisco with fellow-Commissioners Edward W. Allen of Seattle, John H. Clawson of Anchorage, Alaska, and Arnie J. Soumela, Commissioner of the United States Fish and Wildlife Service.

Experts and advisors accompanying the United States delegation included Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, Washington, D. C.; W. C. Herrington, of the U. S. Department of State, Washington, D. C.; Dr. J. L. McHugh, Chief, Division of Biological Research, Bureau of Commercial Fisheries, Washington, D. C.; C. L. Anderson, Commissioner of Fisheries of Alaska; Milo Moore, Director of Fisheries, State of Washington, R. W. Schoning, Director of Fisheries, State of Oregon; R. S. Croker, Chief, Marine Fisheries Branch, California State Department of Fisheries; C. E. Atkinson, Director of the Biological Laboratory of the U. S. Bureau of

Commercial Fisheries, Seattle; and Dr. W. F. Royce, Director of the Fisheries Research Institute, University of Washington. A number of scientists and industry advisors from Alaska, the Pacific Coast States, and Washington, D. C., accompanied the United States delegation.

ITALY-YUGOSLAVIA RENEW FISHING AGREEMENT

On August 16 in Belgrade, Yugoslavia, representatives of the Italian and Yugoslav Governments agreed to renew a fishing agreement regulating the fishing rights in the Adriatic. The original accord was signed in November 1958 and has been in effect since that date. The renewal makes no change in the existing provisions, will take effect on September 1, and will be valid for eighteen months. (United States Embassy, Rome, August 26, 1960.)

Note: See Commercial Fisheries Review, February 1959 p. 40.

WEST EUROPEAN FISHERIES ORGANIZATION

WEST EUROPEAN FISHERY
COMMUNITY PROPOSED:

The West European Fisheries Organization held its annual convention in Hamburg on September 15 and 16, 1960, attended by delegates from Sweden, Norway, Denmark, England, Holland, Belgium, France, Portugal, and West Germany. Discussions centered around proposals by the British Trawler Association for the establishment of a West European Fishery Community.

The Fishery Community would create a link between the European Economic Community and the European Free Trade Association. Its goals would include the establishment of a common fish market, common access to all fishing grounds, the appointment of authorities to ensure adherence to existing fishing conventions, and the preservation of fish stocks. Finally, the West European Fishery Community would be designed to promote sound development of the fishing trades of the contracting parties and, if possible, agreement upon a common external tariff.

The delegates also discussed possibilities for preserving present territorial fishing limits and the detrimental effects of Peruvian fish meal exports on their national fisheries. They stated their desire to have the North-east Atlantic Fisheries Convention of 1959 ratified as soon as possible.

International (Contd.):

WHALING

ANTARCTIC WHALE CATCH FOR 1959/60 SEASON EXCEEDS QUOTA:

Contrary to earlier reports, the catch of baleen whales in the Antarctic for the 1959/60 pelagic season was over, not under, the ceiling catch of 15,000 blue-whale units fixed by the International Whaling Commission. The catch totaled 15,510 units as compared with 15,235 units taken in the 1958/59 season.

**COMMISSION MEETS IN LONDON:**

Research programs and management practices covering the world's whale populations, with particular reference to the Antarctic region stocks, were thoroughly reviewed at the twelfth meeting of the International Whaling Commission, London, England, June 20-24.

Represented at the meeting were the governments of Argentina, Australia, Canada, Denmark, France, Iceland, Japan, New Zealand, South Africa, Sweden, the U. S. S. R., the United States, and the United Kingdom. Argentina acceded to the Convention on May 18, 1960. There were also present observers from the Food and Agriculture Organization of the United Nations, the International Council for the Exploration of the Sea, Norway, the Netherlands, Italy, and Portugal.

The Commission was addressed by the Parliamentary Under-Secretary of State for Scotland in the United Kingdom Government, who pointed out that the growing need for the conservation of marine resources had been given world recognition in recent years. Two of the world's leading whaling nations--Norway and the Netherlands--had withdrawn from the International Whaling Convention as a result of failure outside the Convention to rationalize the fishing efforts of the countries participating in Antarctic pelagic whaling. Nevertheless discussions on the harmonization of claims were continuing outside the Commission and their success was earnestly hoped for.

Although Norway and the Netherlands were no longer party to the Convention, catch limits

Table 1 - Antarctic Whaling Fleets and Production, 1958/59 and 1959/60

Season	Fleets	Catchers	Baleen Whales	Oil	
				Long Tons	Long Tons
1959/60	20	217	32,214	309,343	4,165
1958/59	20	235	30,824	269,741	5,451

During the 1959/60 season the Netherlands and Norway operated outside the International Whaling Convention from which they withdrew in 1959, after the five nations which participate in Antarctic pelagic whaling had failed to agree on national quotas within the ceiling.

The 32,214 baleen whales taken last season comprised 26,412 fin, 3,234 sei, 1,338 humpback, and 1,230 blue whales.

Table 2 - Antarctic Pelagic Whaling, 1960

Country	Fleets	Catchers	Baleen Whales	Oil (Bbls./1/)	Bbls. Per Blue-Whale Unit	Sperm Whales	Oil (Bbls.)
Norway	8	70	9,246	588,450	128.9	1,430	63,438
Japan	6	69	10,959	551,255	105.7	1,398	65,876
United Kingdom .	3	31	3,983	237,420	124.9	454	20,360
U. S. S. R. 2/ . . .	2	34	5,988	337,903	121.2	840	40,397
Netherlands . . .	1	13	2,038	141,031	135.9	43	2,019

1/6 barrels of oil equal one long ton or 2,240 pounds.

2/The U.S.S.R. catch excludes 203 minke and 55 killer whales.

Official results of the 1959/60 season, as compiled by the Committee of International Whaling Statistics at Sandefjord, Norway, and subject only to final adjustment are shown in table 2. (Australian Fisheries Newsletter, July 1960.)

for their fleets had been set for the 1959/60 Antarctic season. The three Antarctic pelagic whaling countries remaining party to the Convention had operated within the ceiling of 15,000 blue-whale units, which was the maximum permitted catch established by the Commission for whaling in the Antarctic. Within that ceiling, Japan and the United Kingdom

International (Contd.):

had set limits for their fleets; the agreement between the five Antarctic pelagic whaling countries which had been sought outside the Commission would have allocated 20 percent of the total permitted catch for the U. S. S. R. The Commission is empowered to determine the size of the Antarctic pelagic whaling quota, but not how it is split up between the floating factory expeditions.

During the 1959/60 season 20 expeditions from these five countries operated in the Antarctic and caught a total of 15,433 blue-whale units in a season lasting 99 days, compared with 69 days in the three preceding seasons. This figure comprised 1,230 blue whales, 26,415 fin whales, 1,338 humpbacks, and 3,234 sei whales. The total catch in the 1958/59 season had amounted to 15,301 blue-whale units, composed of 1,191 blue whales, 25,837 fin whales, 2,394 humpbacks, and 1,402 sei whales. A total of 4,173 sperm whales was taken by all the Antarctic pelagic expeditions in the 1959/60 season as compared with 5,451 in the previous season. The 1959/60 Antarctic pelagic whaling season produced 2,048,159 barrels of baleen and sperm oil; in the previous season the yield was 2,052,010 barrels.

Antarctic land stations in 1959/60 caught 757 blue-whale units, compared with 807 the year before; the sperm whale catch was 89 against 215 in 1958/59. The oil production was 97,673 barrels, about 5,000 less than the previous year.

Outside the Antarctic, 47 land stations and three floating factories were in operation in 1959. A total of 21,500 whales was taken, compared with 24,700 in 1958. The production of whale oil amounted to 326,700 barrels (at six barrels to the ton), about 12,000 barrels more than in 1958, but the production of sperm oil at 343,400 barrels was some 59,000 barrels less.

The unsatisfactory position arising from the withdrawal from the Convention of two of the five Antarctic pelagic whaling countries occupied much of the Commission's attention. A resolution was finally adopted appealing to the Netherlands and Norway to rejoin the Convention in the interests of effective conservation action, which should include an arrangement for the sharing of the total catch and the introduction of an international system of inspection.

To assist these purposes the Commission decided by 7 votes against 2 votes with 4 abstentions to suspend for the 1960/61 and 1961/62 seasons the Antarctic blue-whale unit limit. This action was taken with reluctance and on the understanding that if Norway and the Netherlands should not soon rejoin the Convention, the suspension would be revoked.

In this same context the Commission adopted a resolution asking their Ad Hoc Scientific Committee to carry out a detailed and specified program to improve the collection and interpretation of data, including the use of the latest methods of studying animal populations. The Commission also resolved to appoint three scientists in the field of population dynamics and drawn from countries not engaged in pelagic whaling in the Antarctic to assist in the assessment of the condition of the Antarctic whale stocks and in the determination of any measures that would increase the sustainable yield. The three scientists would report to the Commission within a year of their appointment and would work with the Ad Hoc Scientific Committee.

In setting up this special group of scientists, the Commission signified their intention that the Antarctic catch limit should be brought into line with the scientific findings not later than July 31, 1964, having regard to the provisions of Article V(2) of the Convention.

The International Whaling Commission gives effect to the conservation aims of the Convention through amendments of a Schedule to the Convention requiring a three-quarters majority of those present and voting for their adoption.

Apart from the suspension of the blue-whale unit limit, two other amendments were adopted.

The first of these forbids pelagic whaling expeditions from taking humpback whales in the Antarctic sector to the south of West Australia during the next three seasons; while in the Antarctic sector to the south of East Australia and New Zealand the present open season of four days for pelagic whaling for humpbacks is to be reduced for those three seasons from 4 days to 3 days; Australian and New Zealand land stations catch humpback whales belonging to the same stocks that inhabit those Antarctic sectors and the Commissioners of their respective

International (Contd.):

Governments stated that conservation measures were in force which were reducing the catches made by those land stations.

The second amendment shortens the period during which pelagic whaling expeditions may take blue whales in the Antarctic. The season for taking blue whales there will henceforth open on February 14 instead of February 1 and will end as before on April 7. The purpose of this change is to give additional relief to a species of whale the populations of which are thought by the Commission's scientific advisers to be in an increasingly serious condition. This amendment was adopted without opposition.

The Commission considered the report of an expert Working Party which had been set up after the Eleventh Meeting to study the question of the humane slaughter of whales. It was noted that at present there was no conclusive evidence that killing whales by electrical means was more humane than the present method of the explosive harpoon and that the chief criterion was the speed of killing. There were no other methods likely to prove more humane. There was a prospect, however, of further progress towards the development of a satisfactory and effective electric harpoon, and the Commission agreed with the suggestion of the Working Party, which will continue in being, that to this end there should be consultations at a technical level between representatives of the whaling industries.



Angola

FISHERIES PRODUCTION AND EXPORTS, 1958-59:

Fish production in Angola declined during 1959, continuing a trend evident since 1957. Landings dropped from 278,054 metric tons in 1958 to 267,170 tons in 1959. The decrease in sardine landings was the most marked, from 92,185 tons in 1958 to only 44,601 tons in 1959. The mackerel landings were also down about 50 percent. Horse mackerel

Table 1 - Angola's Production of Processed Fishery Products, 1958-59

Product	1959 (Metric Tons)	1958
Canned fish	1,264	1,282
Dried fish	23,586	28,332
Fish meal	46,170	47,803
Fish oil	4,859	7,254

landings were up a bit and small horse mackerel landings increased by 50 percent. These are the main species used by the fishing industry to produce fish meal and oil. The spiny lobster landings quadrupled and shrimp landings in 1959 remained about the same as in 1958, both at high levels.

The decline in the industry by fishing centers and species of fish was mixed. The main impact of the lower landings was felt in the Mocamedes fishing area where the catch dropped from 171,829 tons in 1958 to 152,245 tons in 1959. The sardine catch of this port was one-eighth that of the previous year. Fish landings in the Benguela area actually increased from 98,342 to 107,025 tons, but the ex-vessel price received declined from 68,856 to 51,088 contos (US\$2,383,000-\$1,773,000). The Luanda fishing area was the least affected of the major producing areas; it had an average year and benefited from the greatly increased spiny lobster catch. The spiny lobster fishermen there caught 25 tons of lobsters worth 608 contos (US\$21,100), as compared with the previous record catch of 7 tons worth 191 contos (US\$6,600) in 1958. The fishermen of Santo Antonio do Zaire also enjoyed a profitable year, but this area is of little importance to the fishing industry.

The plight of the industry has been caused by decreased fish catches, many uneconomic factories using primitive techniques, and world-wide overproduction of fish meal which has lowered the international price to a level below the Angolan cost of production. Studies were begun during the year which were aimed at a complete reorganization of the industry and a concentration of production on such primary products as dried and canned fish with a de-emphasis on such products as fish meal and oil. At present fish meal is the principal product of the Angolan industry. By the end of 1959 it was apparent to all that

Table 2 - Angola's Exports of Fish Meal and Dried Fish, 1958-59

Product	Quantity		Value			
	1959	1958	1959		1958	
	(Metric Tons)		Contos	US\$	Contos	US\$
Fish meal	51,228	81,243	205,620	7,135	289,599	10,021
Dried fish	13,965	16,476	75,900	2,634	90,008	3,114

1/1,000 escudos.

some kind of drastic action was required to assist the industry over its present financial crisis and to begin making preparations to meet the long-term difficulties. First steps in these programs were taken by the government by suspending the collection of income

Angola (Contd.):

Table 3 - Average f.o.b. Prices for Angolan Fish Meal Exports, 1950-59

Product	Year									
	1959	1958	1957	1956	1955	1954	1953	1952	1951	1950
Fish meal	139.14	123.18	120.76	131.14	139.45	129.07	123.88	112.80	102.77	122.49
Note: Portuguese escudos converted to US\$ at rate of 28.9 escudos equal US\$1 for 1950-58, and 28.82 escudos equal US\$1 for 1959.										

taxes from the fishing firms in 1959 and the creation late in December 1959 of the Fund to Support the Fishing Industry. The capital for the Fund was to come from a tax on gasoline sales and an annual subsidy from the Government. It would grant loans to fishing firms. (United States Embassy, Luanda, September 20, 1960.)

* * * * *

FISH MEAL INDUSTRY TRENDS, FIRST HALF OF 1960:

A price differential or subsidy on fish meal exports was authorized by Angolan Legislative Diploma No. 3054 of August 10, 1960, but this authority had not been exercised up to the end of September 1960.

The "Fund to Aid the Fishing Industry" is empowered to grant to the fishing industries an unspecified amount of money as a subsidy to cover part of the price differential between the international market quotations for fish meal and the local cost of production. This subsidy is a reimbursable, interest-free loan. The power to grant the subsidy is retroactive to July 1, 1960.

Angola's Exports of Fish Meal, January-June 1960					
Country of Destination	Quantity	Value		Average F. O. B. Prices Per Metric Ton	
		Metric Tons	Escudos	US\$	Escudos	US$
Portugal . . .	5,375	16,508	577	3,071	107.37
Mozambique . .	122	414	14	3,393	118.63
West Germany	755	2,343	82	3,103	108.49
Italy	1,891	5,482	192	2,899	101.35
Other	1,688	4,745	166	2,811	98.27
Total	9,831	29,492	1,031	3,000	104.87

Note: Escudos converted at rate of 28.6 escudos equal US\$1.

The Angolan Government states that subsidy payments have not yet been made. Industry representatives have been led to believe that a differential of US\$10 a metric ton will be paid to them. A Luanda fish-meal producer states that he had recently exported 200 tons of fish meal at a price of US\$75 per metric ton f.o.b. He believes that he will receive the \$10 subsidy from the Government, but considers that since his costs were \$100 per ton he was still losing \$15. Since then prices are said to have im-

proved, a sale allegedly having been made on September 27 for \$92 a ton f.o.b. (United States Embassy, Luanda, September 28, 1960.)



Argentina

IMPORT SURCHARGES REMOVED ON NEW FISHING VESSELS:

The Argentine Government has issued two decrees governing the domestic shipbuilding industry and the importation of vessels, provisions of which affect the fishing industry. According to Article 1, paragraph b of Decree No. 10,032 of August 26, 1960, new vessels of up to 3,000 metric tons gross weight may be imported free of surcharges for use as fishing vessels or for refrigerated transportation. This exemption from import surcharges will be effective for two years from the date of issuance of the decree. Article 5 of the same decree specifies that no exemption is made for used vessels; the import surcharges remain at 150 percent. The Government will compensate domestic shipbuilders for the loss of these protective surcharges with a subsidy.

Article 5 of Decree No. 10,033 of August 26, 1960, declares that the Government will pay shipbuilders of vessels under 3,000 metric tons gross weight which are to be used as fishing vessels or refrigerated transport a 40-percent subsidy based on the average European cost of such vessels. The complete text of these decrees was published in the Boletín Oficial of September 1, 1960.

For several years the Argentine Government has recognized the necessity of reequipping and expanding the fishing fleets, but until these decrees had been issued nothing concrete had been done to achieve that goal. While the fishing industry awaited eagerly the publication of these decrees, prior to their issuance opinion was divided as to the form they should take. Cannery owners sought only to lower the import surcharges on fishing vessels. Owners of fishing vessels, who in most cases operate their own

Argentina (Contd.):

boats and upon whom the canneries depend for supplies, opposed the lowering of surcharges without the simultaneous creation of special credit facilities for their use. They claim that only the canneries have sufficient resources to import new vessels. It would appear that the decrees as issued favor the canneries in this dispute. In fact, the surcharges on less expensive used vessels were not lowered. It was such used vessels that the fishermen had intended to purchase. However, it is reported that the Government is studying the creation of special long-term, low-rate credit facilities for the fishermen. (United States Embassy, Buenos Aires, September 21, 1960.)

**FIRST TWO FISHING VESSELS
IMPORTED UNDER NEW DECREE:**

The first two fishing trawlers to be imported under the recent Argentine decree removing import surcharges from such vessels were due to arrive in the Port of Mar del Plata the week of October 3, 1960, according to press reports. The vessels were purchased by a cannery in Mar del Plata.

The trawlers (Neptune and Mar del Plata) were constructed in Denmark. They are steel-hulled, 25.6 meters (84 feet) in length, and have 350-hp. motors. Reportedly the vessels are equipped with modern electronic equipment, and nylon nets. The holds have a capacity of 1,000 boxes of 50 kilograms each (about 110,000 pounds), according to an October 6, 1960, report from the United States Embassy in Buenos Aires.

**Australia**

**NEW SPINY LOBSTER FISHERY
REGULATIONS FOR WESTERN AUSTRALIA:**

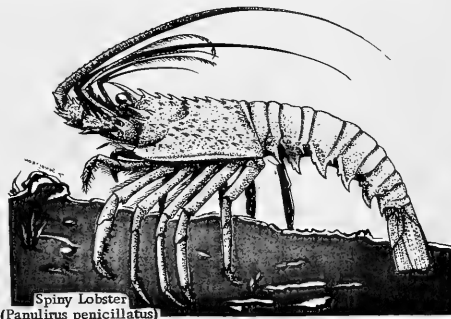
New regulations for the spiny lobster fisheries of Western Australia were published in the Western Australia Government Gazette of May 20, 1960. These suggestions supersede those published June 27, 1958, in the same publication.

(1) Fishermen and boats engaged in the taking of crayfish or spiny lobster between the 30th and 33rd parallels of south latitude

may not during the same calendar year be so engaged anywhere between the 28th and 30th parallels.

(2) Fishermen and boats so engaged between the 28th and 30th parallels may not during the same calendar year be so engaged anywhere between the 30th and 33rd parallels.

(3) Save as mentioned in clauses (4), (5), and (6) hereunder, no restrictions in regard to the operations of fishermen or boats engaged in taking crayfish anywhere between the 28th and 33rd parallels shall be applied in relation to waters north of the 28th parallel or south of the 33rd parallel.



Spiny Lobster
(*Panulirus penicillatus*)

(4) Fishermen and boats engaged in the taking of crayfish in the Abrolhos Islands area, as defined in clause (5) hereunder, shall not be permitted during the whole of the Abrolhos Islands season to engage in the taking of crayfish elsewhere.

(5) No freezer-boat shall engage in the taking of crayfish in the Abrolhos Islands area, or in the Abrolhos Islands area possess, store, cut up, handle, preserve or treat crayfish or portions of crayfish. The Abrolhol Islands area comprises the whole of the Western Australian waters bounded by lines starting from the intersection of 28 degrees South Latitude and 113 degrees 50 minutes East Longitude and extending southeasterly to the intersection of 30 degrees South Latitude and 114 degrees 40 minutes East Longitude, thence west to 113 degrees East Longitude, thence north to 28 degrees South Latitude and thence east to the starting point.

(6) Freezer-boats shall be permitted to catch crayfish north of the 28th or south of the 33rd parallel and to process their own

Australia (Contd.):

catch, but shall not be permitted to process crayfish caught by any other boat or person.

(7) Freezer-boats shall be permitted to process crayfish caught by other boats or persons north of the 7th parallel of South Latitude. (Australian Fisheries Newsletter, July 1960.)



Bahama Islands

FISHERIES OF THE TURKS
AND CAICOS ISLANDS:

The two major fisheries of the Turks and Caicos Islands in the Bahamas are for spiny lobsters and conchs. Spiny lobsters are caught by various means, including "bully" nets, diving, and traps. The use of spears and grains has been prohibited since 1958. In 1959, 62 percent of the catch was made by using "bully" nets, 30 percent by traps, and 8 percent by divers. Comparative fishing with different traps or pots has indicated that the Jamaica-type traps gave better results in both shallow and deeper waters than the Cuba, Florida, and Honduras types. Most effective bait was two-day-old conch meat and shark meat.

A United States firm has an exclusive export license for frozen lobster tails. Exports have ranged from 35,200 pounds to 128,640 pounds of spiny lobster tails over the last 9 years (average 90,928 pounds). The spiny lobster tails are graded for export into 7 categories, according to weight. They are shipped by air (3 hours flight) in 40-pound cartons, up to 300 cartons per flight, from South Caicos to Miami, where they are loaded into refrigerated trucks for shipment to New York City. An export duty of US\$0.01 a lobster is levied.

The Caicos Islands have for many decades shipped dried conch meats to Haiti. Average shipments between 1941 and 1955 were about 3 million meats, and about 2.2 million meats per year from 1956 to 1959. The dried meats average 3 ounces each and their export value is from 6-8 shillings (US\$0.84-1.12) per 100. While in the past the shells were not utilized, a Florida firm obtained a 3-year export license in 1960 for 500,000 to 750,000 shells per year. An

export duty of US\$0.01 is levied on every 5 shells. Prices paid are 30 shillings (\$4.20) per 100 for large, 21 shillings (\$2.94) for medium, and 14 shillings (\$1.94) for small shells. (West Indies Fisheries Bulletin, May/June 1960.)



Belgium

CANNED FISH AND SHELLFISH OFFERING
PRICES TO ANTWERP IMPORTERS:

Canned fish and shellfish importers in Antwerp, Belgium, in early September reported the following c.i.f. offers for imported canned fish and shellfish:

Offering Prices (c.i.f.) to Antwerp Importers of Canned Fish

Product and Origin	Cans/Case & Contents Weight	Price c.i.f. Antwerp
		US\$ Per Case
Salmon:		
Fancy pink (Japan)	48/16-oz.	18.62
Kiltie Fancy Pink (Canada)	48/16-oz.	24.67
Keta (chum) (Japan)	48/16-oz.	17.64
Delmonte Red (U. S.)	48/16-oz.	36.65
Lobster:		
National Banner (Canada)	48/6½-oz.	40.69-43.26
	48/2¾-oz.	22.44
	24/13-oz.	40.17
King Crab:		
Chatka (U.S.S.R.)	96/7-oz.	55.00
Fancy Quality (Japan)	48/6½-oz.	28.80-29.00
Tuna:		
In oil (Japan)	48/7-oz.	7.00-7.60
In oil, Customer's label (Peru)	48/7-oz.	6.40-6.80
Pilchards (sardines):		
Booth's (U. S.)	48/15-oz.	9.25
Customer's label (Japan)	48/15-oz.	7.80-7.90
Customer's label (Japan)	96/7½-oz.	9.30
Customer's label (S. Africa)	48/15-oz.	7.84-8.05
Sardines:		
Olive oil (Portugal)	100/¼-club½/	9.20-9.50
Olive oil (Morocco)	100/¼-club½/	8.40
	1/4.4-oz. per can.	

Note: From United States Consulate in Antwerp, September 9, 1960.



British Guiana

NEW POLICY TO ENCOURAGE
DEVELOPMENT OF FISHING INDUSTRY:

The Government of British Guiana has decided on a policy to encourage the development, by local or foreign capital, of the fishing industry. The concessions and conditions for establishment of locally-incorporated companies for the purpose of engaging in shrimp trawling, with the employment of mainly Guianese labor, include: (1) duty-free import of machinery, etc., and of fishing vessels with equipment, and (2) the Government control of disposal of catches

British Guiana (Contd.):

on the local market, in accordance with the Fisheries Ordinance and Regulations, but without restrictions on imports. Companies will be subject to local income tax as levied generally on companies and individuals, but the Government would be prepared to consider granting an income tax holiday for the processing and canning of fish, crustaceans, and all types of seafood and marine products and the manufacture of fish meal, but will not grant a tax holiday for fishing and freezing and/or packaging. Imports of supplies, other than fishing vessels and machinery for canning or fish meal plants, will be subject to import duty, and exports of shrimp and fish to an export duty, which is at present $1\frac{1}{2}$ percent ad valorem.

A French company plans to set up a plant for fish processing and for the manufacture of fish meal and other products in Berbice. It is proposed to establish a fishing base, complete with boats and refrigeration plant and a shrimp-culture station on approximately 1,000 acres of swamp land. The Government is expected to participate in the latter project. (West Indies Fisheries Bulletin, May/June 1960.)



Canada

BRITISH COLUMBIA VESSELS FISH FOR TUNA OFF CALIFORNIA COAST:

Four catches of albacore tuna were landed during the week ending September 23 by four British Columbia salmon seiners. It is reported that the fish were caught mainly by salmon seines, but in part on trolling lines. Catching albacore by salmon seines required fast sets. The vessels, which left Vancouver early in September, were out 18-21 days but poor weather made it impossible to seine for the first 8-9 days, when trolling was tried with no great success. One vessel caught 2 tons and another 5 tons by trolling. A third vessel, Blue Pacific I, with the best catch (30 tons), made one seine set of about 10 tons. The Pacific Belle was second high boat with 16 tons, Skardale next with 15 tons, and the Dominator (70-foot steel combination halibut-herring vessel) with $6\frac{1}{2}$ tons. In the case of the Dominator, it was reported that the noise of the rings as the seine net was let out frightened the "wild" albacore away. In one set on a "huge body

of fish" they took only a single fish that had been gilled in the mesh. Most of the fishing was done 100 miles southwest of the mouth of the Columbia River.

At the dock the fish were graded out when unloaded. About 15-20 percent were graded as Number 2 fish because of splits and bruises. A British Columbia packing firm bought the albacore at \$300 a ton for Number 1 and \$150 a ton for Number 2.

A British Columbia fishermen's union is asking that the Canadian Government charter 6 British Columbia seiners for exploratory fishing to develop a Canadian tuna fishery. (The Fisherman, a fishery trade periodical, September 23, 1960.)

* * * * *

FISH MEAL AND OIL PRODUCTION, 1958-59:

Canadian fish-meal production amounted to 72,393 short tons in 1958 as compared with 77,177 tons in 1959.

Canadian fish-oil production during 1959 was estimated at 7,737,000 Imperial gallons.

The price paid to British Columbia fishermen for herring, the main species of fish used for reduction, was C\$13 per short ton during the last few months of 1959. The Canadian authorities state that most companies did not resume buying after the Christmas close-down.

Waste from the fresh fish-processing (filleting) plants is the chief raw material used by the fish-meal plants on the Atlantic Coast.

Most but not all of the producers of fish meal and oil are members of industry associations. On the Pacific Coast the group is known as the Fisheries Association of British Columbia; for the Atlantic Coast, the group is the Atlantic Fisheries By-Products Association. (United States Embassy in Ottawa, July 20, 1960.)

* * * * *

LABELING REQUIREMENTS FOR CANNED SARDINES ANNOUNCED:

The Canadian Inspection and Consumer Service, Department of Fisheries, Ottawa, Canada, has issued a ruling on the labeling of canned fish marked "Sild" or "Brisling" imported into Canada.

Canada (Contd.):

It is the view of the Department of Fisheries that for informative labeling, the word "Sardines" should be used in association with the words "Sild" or "Brisling." Furthermore, the words "Brisling Sardines" or "Sild Sardines" shall be displayed in letters of equal height and prominence. However, where the word "Sardines" only appears on the label, it will not be necessary to indicate whether the contents are "Sild" or "Brisling."

In order to give the importers time to conform to the labeling requirements of these products, the Department of Fisheries will permit the use of existing stocks of labels until March 31, 1961. All imports of "Sild" and "Brisling" packed after that date will, however, be required to comply with these labeling requirements.

* * * * *

OUTLOOK FOR THE GEORGES BANK SCALLOP FISHERY:

History of Fishery: Georges Bank supports the world's largest scallop fishery. United States boats started extensive commercial fishing on this Bank in the early 1930's and since then there has been a continuous history of good production. After World War II, United States landings increased and since 1955 they have remained in the neighborhood of 18 million pounds of shucked meats annually.

Canadian boats began scallop fishing on Georges Bank just after World War II. At that time few boats were equipped for offshore scallop fishing and until 1952 one or two boats made intermittent trips to the Bank. Other areas such as St. Pierre Bank and Port au Port Bay, Newfoundland, were fished by some boats. Since 1952, however, the Canadian offshore scallop fleet has concentrated almost exclusively on Georges Bank and has expanded rapidly. Annual landings have risen steadily and in 1959 reached 4.3 million pounds. So far, 1960 landings have continued this rising trend.

Canadian crews have become much more efficient at scallop fishing, but the primary cause of increased Canadian landings is the build-up of the offshore scallop fleet. From one or two boats prior to 1952, the fleet has increased to 20 boats and indications are that more boats will be constructed. The

United States fleet has also expanded and over 70 boats now sail out of New Bedford. The result is that steady, increased pressure has been placed on Georges Bank scallop stocks.

Fluctuating Limits: In any natural population, there is a limit to the number of animals that can be caught. This limit is variable because variable natural conditions regulate reproduction and abundance. For example, in the Digby scallop fishery we have found that great abundance changes are related to water temperature at spawning time. Georges Bank scallop stocks also show great year-to-year changes in success of reproduction. These changes are usually uncontrollable but sometimes they are predictable.

In the past year there has been a great abundance of market-size scallops on Georges Bank. An accurate estimate of their age is difficult but it appears that almost all the scallops now being fished were spawned in the same year--either 1954 or 1955. A few of these were fished in early 1959, but by late 1959 they constituted the bulk of the catch and 1960 large catches depend almost entirely on this single year-class. We do not understand why this one spawning was so successful but with continued research we hope to find the answer. Even if we can't explain the situation, we are able to predict the effects it will have.

Predicted Decline in Landings: Canadian and United States scientists have been sampling the Georges Bank scallop population on both commercial and other beds for several years. Many of the samples have been taken with a small-mesh drag, which captures both market-size scallops and small scallops that must grow for several years before they reach commercial size. Counts of these undersize scallops give a fair idea of what the future holds for the fishery. For instance, we were able to foresee the 1959-60 increase in landings from the tremendous number of scallops just under commercial size which came up in our early 1959 samples.

Our 1960 samples contain very few small scallops. The year-class being fished now is very abundant but the next one or two year-classes appear to be much below normal. This means that undoubtedly catches will decline significantly when this abundant year-class is fished out. From our information it appears that catches will begin to decrease by the end of this year and will remain low for at least two years.

Canada (Contd.):

Effects of Decline: It is difficult to predict the extent and the effect of greatly reduced landings from the fished areas. In most fisheries when production drops in one area the fleet moves to other grounds. The scallop fishery is somewhat different than other fisheries; first, because scallop stocks do not move about like schools of cod and haddock; and second, because no other area has extensive scallop populations like those found on Georges Bank. Furthermore, Georges Bank has been well explored and it appears to have no areas, fished or unfished, which have extensive quantities of young scallops. It is doubtful if other parts of the Bank can make up for the big drop in catches from regularly fished areas.

Our offshore fleet will probably be unable to turn to other regions to offset reduced catches from Georges Bank. Scallop beds in the Gulf of St Lawrence are too small and their production too variable from year to year. Surveys of other offshore banks indicate that scallops are too sparse to make fishing commercially attractive for an extensive period of time. The fleet will probably have to be satisfied with the small catches it will be able to take on Georges Bank. Total production from our whole coast as well as from Georges Bank will probably remain low for at least two years.

Reduced catches may encourage some Georges Bank fishermen to shuck many of the small scallops they now throw overboard. This would be a short-sighted policy. In the first place it would require more shucking effort to produce every pound of meat. Secondly, it would probably delay recovery of the stocks of large scallops to more abundant levels.

Planning Adjustment: It is hoped that releasing this statement now will aid the offshore scallop fishery to plan for the changes we have predicted. Our research program is continuing and it is planned to make periodic reports to industry on the status of the Georges Bank scallop population.

--By N. Bourne, Biological Station,
Fisheries Research Board of Canada,
St. Andrews, N. B.
(September 1960).

* * * * *

12-MILE FISHING LIMIT UNDER CONSIDERATION:

Canadian Government authorities have under "active consideration" the declaration of a 12-mile fishing limit off Canada's sea coasts, according to the October 19, 1960, Ottawa Journal. But the paper did not indicate when a decision would be announced. The present fishing and territorial limit for Canada is three miles.



Cuba

PROGRAM TO BUILD 570 NEW FISHING VESSELS ANNOUNCED:

The Cuban press has announced that on October 1 work was started on the construction of 570 new fishing vessels from 33-75 feet in length in ten shipbuilding centers located from Camaguey to Pinar del Rio under the supervision of the Naval Construction Office of the Fisheries Department of the National Institute for Agrarian Reform (INRA).

According to the press account, 205 units of the sigma type, 33 feet in length, will be constructed in the first stage of the shipbuilding plan, in the following shipbuilding centers: Puerto Esperanza 40; Surgidero de Batabano 20; Cardenas 40; Caibarien 30; Isabela de Sagua 30; Cienfuegos 15; Nuevitas 15; and Santa Cruz del Sur 15.

Later on, other types will be built, including the Omicron, 75 feet in length. The stated purpose of the fishing vessel program is to stimulate to the greatest possible extent the fishing and shipbuilding industries in Cuba in order to foster economic development. The shipbuilding plans were said to have been finalized at a meeting of the heads of workshops and provincial delegates of Ship Construction held in the INRA's Fisheries Department on September 16, 1960. (The United States Embassy in Havana reported on September 26, 1960.)



Denmark

DISPUTE OVER PROFIT-SHARING BETWEEN VESSEL OWNERS AND CREWS AT ESBJERG ENDS:

Upwards of 500 fishing vessels were idle early in September 1960 in the Danish West

Denmark (Contd.):

Jutland fishing port of Esbjerg as a result of a controversy which began August 22 between the vessel crews and vessel owners over the division of profits. Originally affecting only the herring boats, the tie-up spread to virtually the entire Esbjerg fleet. As of early September the controversy had already cost the fishermen of Esbjerg about ten million kroner (about US\$1.5 million) in shares. Esbjerg is Denmark's largest fishing port, the value of the annual catch landed there topping 75 million kroner (US\$10.9 million).

The trouble began when the Esbjerg Fishing Captains' and Vessel Owners' Association refused to accede to the demand of the Fishermen's Union that crew members be accorded a share in the annual profits of a vessel. Under terms of the current agreement, crew members share in a portion of the value from the sale of each trip, but the remainder of the value is accumulated by the captains and owners in a reserve fund and then divided up between themselves on an annual basis. The crew members now want a slice of this portion as well.

After many days of refusing to enter into discussions except each on his own terms, the Owners' Association and Union representatives sat down on September 6 and reached a preliminary agreement to discuss differences.

The tie-up came to an end on September 15, after the Fisheries Minister had stepped in to promote peace between vessel owners and crew members.

Terms of the agreement, worked out by the vessel owners and crew member representatives and ratified by the Fishermen's Union, provide for those crew members who are share fishermen to be given shares of reserve-fund payments as well as shares in immediate sales. The share fishermen maintained that the captains were in a position to direct an unfair portion of the receipts into the reserve fund at the expense of that portion which was shared with crew members.

Other work and wage conditions under contention were deferred for later discussion. One specific point not gained by the Fishermen's Union was its demand that all vessels fishing for the cooperative herring

oil factory agree to hire only union crew members.

Fishing vessels began to put off from Esbjerg soon after the agreement was ratified. (United States Embassy, Copenhagen, September 7, 1960.)

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FOREIGN TRADE IN FISH MEAL AND MARINE OILS, 1959:

Exports: In 1959 Danish exports of fish meal amounted to 58,770 metric tons, valued at US\$10.7 million. The United Kingdom and the Netherlands were the principal buying nations (see table 1).

Table 1 - Denmark's Exports of Fish Meal by Type and Destination, 1959

Type and Destination	Qty.	Value	
		Metric Tons	US\$ 1/ 1,000
Herring Meal:			
Finland	1,782	2,342.0	339.6
Sweden	1,695	2,132.0	309.1
Belgium-Lux.	501	618.0	89.6
Czechoslovakia	626	778.0	112.8
France	540	706.0	102.4
Holland	13,185	16,629.0	2,411.2
Ireland	759	970.0	140.7
Italy	809	1,086.0	157.5
Switzerland	2,024	2,628.0	381.1
United Kingdom	30,456	38,747.0	5,618.3
West Germany	2,858	3,566.0	517.1
East Germany	703	874.0	126.7
Egypt	60	79.0	11.5
Mexico	40	54.0	7.8
Philippines	76	100.0	14.5
Total	56,114	71,309.0	10,339.8
Other Fish Meal:			
Sweden	210	249.0	36.1
Belgium-Lux.	118	73.0	10.6
Czechoslovakia	96	111.0	16.1
Gibraltar	5	6.0	.9
Holland	449	461.0	66.8
Italy	10	12.0	1.7
Switzerland	20	24.0	3.5
United Kingdom	378	368.0	53.4
East Germany	671	779.0	113.0
West Germany	699	678.0	98.2
Total	2,656	2,761.0	400.3
Grand Total	58,770	74,070.0	10,740.2

1/Values converted at rate of one krone equals US\$0.1450.

During the first four months of 1960 Danish fish-meal exports amounted to 9,841 metric tons, valued at 7 million kroner (US\$1.0 million), compared with 26,000 tons, valued at 27.5 million kroner (US\$4.0 million) for the same period in 1959. As of June 1960 the average export price was approximately 60 øre a kilogram (US\$78 per short ton) as compared with 1.16 kroner a kilogram (US\$152 per ton) a year earlier. Peruvian competition was blamed for the price decline; however, Peruvian prices also declined from US\$140 to \$70 a metric ton over the same period.

Denmark (Contd.):

It was reported that stocks of fish meal and oil were accumulating in Denmark in July of 1960, with consequent downward pressure on the price of industrial fish for reduction. Two Esbjerg marine oil factories reduced their prices for industrial fish to 14 øre per kilogram (US\$18 per short ton) in June 1960. Danish fishermen have attempted to market their industrial catches abroad, but have found that the prices in Norway dropped from 17 to 12 øre per kilogram (US\$22 to \$16 per ton), and in Holland, down to 8 øre per kilogram (US\$10 per ton).

Danish exports of fish solubles amounted to 1.5 million kroner (US\$217,500) in 1957, and increased to almost 7 mil-

Table 2 - Denmark's Imports of Fish Meal by Type and Origin, 1959

Type and Origin	Value		
	Qty. Metric Tons	1,000 Kroner	US\$ 1/1,000
Herring Meal:			
Iceland	523	617.0	89.5
Norway	241	251.0	37.3
Total	764	878.0	127.3
Other Fish Meal:			
Iceland	8,404	9,557.0	1,385.8
Norway	3,970	4,532.0	657.1
United Kingdom ..	300	355.0	48.6
Total	12,674	14,424.0	2,091.5
Grand Total	13,438	15,302.0	2,218.8

lion kroner (US\$1.0 million) in 1958, and to 11 million kroner (US\$1.6 million) in 1959 (of which the United States received an amount valued at 10 million kroner or US\$1.5 million). But only 129 metric tons were shipped to the United States in the first four months of 1960 as compared to 23,000 tons for the year 1959. Whereas in 1959 United States importers paid prices ranging from US\$80-95 per short ton, this year they

Table 3 - Denmark's Imports of Marine-Animal Oils 1/ By Type and Country of Origin, 1959

Type and Origin	Value		
	Qty. Metric Tons	1,000 Kroner	US\$ 1,000
Herring Oil:			
Norway	191	346.0	50.2
Sweden	518	606.0	87.9
West Germany	5,342	6,708.0	972.7
Portuguese W. Africa	504	638.0	92.5
Peru	1,103	1,198.0	173.7
United States	519	663.0	96.1
Total	8,177	10,159.0	1,473.1
Medicinal and Veterinary Train Oil:			
Iceland	311	485.0	70.3
Norway	1,325	2,254.0	326.8
United Kingdom ..	57	127.0	18.4
West Germany	504	775.0	112.4
Total	2,197	3,641.0	527.9
Grand Total	10,374	13,800.0	2,001.0

1/Does not include imports of 7,164 tons of whale oil.

would not accept shipments priced at \$35 per ton freight inclusive. It is reported that the United States is now covering its needs for fish solubles by domestic production, and that there are large stocks of fish solubles now in storage on the East Coast. For this reason, Danish producers are storing fish solubles in the hope that the market will improve in the future.

Imports: In 1959 Denmark imported 13,438 metric tons of fish meal, principally from Iceland and Norway; it was valued at US\$2.2 million (see table 2).

Denmark's 1959 imports of marine oils amounted to 8,177 metric tons of herring oil, valued at US\$1.5 million, and 2,197 tons of medicinal and veterinary train oil, valued at US\$2.0 million (see table 3). (United States Embassy, Copenhagen, June 21, 1960.)



Ecuador

FISH MEAL AND OIL INDUSTRY:

The Ecuadorian fish-meal industry is based principally on the utilization of waste from tuna canning supplemented by crudely-processed sun-dried fish. Production of meal is estimated to be about 500 tons a year. Neither oil nor stickwater are produced. All meal currently produced in Ecuador is used within the country for animal feed.

There is only one mechanical dryer in operation. It is connected with a tuna cannery at Manta. It is a batch dryer, using steam, that can handle about 1½ tons of cooked tuna scrap in six hours. However, since the material is not pressed to extract the oil, it has been found preferable to process the scrap in the dryer for two hours and then sun-dry it on the ground for six days before milling and bagging. Although the protein content is lowered somewhat by this method, the oil content is brought down appreciably.

The tuna heads, since they are removed from the whole fish before cooking, are processed separately. The heads are retained until the lot of fish for the day has been cooked, then they are cooked and placed in the dryer for two hours, and sun-dried later. The tuna viscera are discarded.

The tuna meal, which comes from skipjack tuna, is reported to run between 50 and 70 percent protein with the heads yielding the lower values.

There are several small operations near Valdivia and Namas that sun-dry thread herring (pichagua, *Opisthionema libertate*). Processing is simple. The fish are cooked and then spread on the ground to dry and when dried, ground into meal.

Before the world-wide drop in fish-meal prices, several persons were interested in installing fish-meal equipment. But with the break in the market, these projects have been abandoned.

In Manta there are 25 small bait-boats fishing for skipjack and four more under construction. These boats are all privately owned—mostly by fishermen. They are 40 to 50 feet long and carry crews of 15 to 20 men. When a mothership is not available, the boats return to port daily to unload the catch since the boats are not equipped with refrigeration nor do they carry ice. The fishermen were reported to be receiving 1,100 sucres (about US\$65) per short ton for skipjack. The thread herring fishermen are said to be paid 10 to 11 sucres per 100 pounds (about US\$11.24-12.36 per short ton).

Tuna meal, in quantity lots to distributors, was quoted in October 1960 at 70 sucres per 100 pounds (about US\$78.60 a short ton), f.o.b. plant.

Ecuador (Contd.):

Export charges on meal consist of a tax of 10 sucres (about 57 U. S. cents) a metric ton (gross weight) plus port charges of 1/4 of one percent of the f.o.b. price.

There are no import duties on fish meal imported for fertilizer. If it is imported for animal feed the duties are 10 centavos a kilo (about US\$6.67 a metric ton) specific plus 3 percent ad valorem. In either case, whether imported as feed or fertilizer, there are certain other charges. These consist of:

1. 135 sucres per 100 kilos (about \$90 a metric ton) for pier taxes.
2. 9.5 percent of f.o.b. value for consular fees.
3. 2.0 percent of f.o.b. value additional fee.
4. 5.0 percent of c.i.f. value for Comision de Valores.
5. 1.0 percent of c.i.f. value additional fee.

According to the Banco Central del Ecuador no fish meal was imported in 1958 or 1959, and during the first five months of 1960 only a sample of about 211 pounds was imported. According to this same source fish-meal exports began in 1957 when 188 metric tons were exported. In 1958 exports were 47 tons and in 1959 they amounted to 295 tons. There have been no exports of fish meal since October or November 1959.

There are no indications that processing procedures will be changed in the near future nor are there any plans for utilizing the stickwater or the oil.

Owing to increased poultry production, the consumption of fish meal in Ecuador has been increasing during the past 2 or 3 years. Annual consumption of fish meal is still quite small and there is no indication of any great increase in the immediate future. The fish meal is used chiefly in poultry feed since it is reported that prepared feeds are still too costly for pigs. Local production of meal will probably take care of all immediate requirements.

The principal oil imports of marine origin are whale and cod oil. During the first five months of 1960, according to the Banco Central, 83.9 metric tons of whale oil, 10.7 tons of cod oil, and 4.2 tons of fish oil were imported. There is no indication that local production will be able to replace these imports in the near future.

It does not appear probable that Ecuador soon will be in a position to provide any quantities of fish meal or oil for export. The production of tuna meal is limited to cannery waste and the country can probably consume all that is produced.

Two other sources of meal and oil appear to be present--the pinchagua (thread herring) and the anchoveta (*Ceten-graulis*), but it is probable that the stocks of these two species are limited in abundance since they are reported not to occur along the entire coast. Their distribution is scattered. The anchoveta is reported to be most abundant in the Gulf of Guayaquil while the pinchagua is more prevalent in the vicinity of Salinas and near Esmeraldas. The pinchagua is now being used for fish meal to some extent but there are no plans for expansion. (United States Embassy, Mexico City, report of October 11, 1960.)



Egypt

LOAN BY UNITED STATES TO
AID SHRIMP FREEZING FIRM:

The Development Loan Fund on October 24, 1960, announced the signing of a United

States Government loan of \$200,000 to a privately-owned company of Alexandria, Egypt, to help expand and improve its present vegetable and fruit canning and shrimp freezing operations.

The project involves the procurement in the United States of a shrimp grader and shrimp freezing equipment plus equipment for processing vegetables; boiler and related equipment; and workshop and laboratory equipment. This equipment will provide the company with facilities to balance its operations for year-round production rather than seasonal fluctuations, and the freezer equipment will allow year-round storage of shrimp.

This is one of the priority projects in the first Five-Year Industrial Plan of the Egyptian Region of the United Arab Republic. The Region has sought to establish a sounder balance between production of food crops and nonfood market crops, in order to reduce its dependence upon food imports. All of the vegetable and citrus fruits are grown locally, and the shrimp is available from the local fishing industry. Hitherto lack of facilities for processing and for deferred merchandising of perishable crops has discouraged producers.

Note: Also see Commercial Fisheries Review, November 1959 p. 64.

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IMPORT LICENSES FOR MORE
JAPANESE CANNED FISH ISSUED:

The Government of the United Arab Republic has announced that it would issue import licenses on canned fish from Japan for the second time this year. The amount of the licenses will be US\$1,000,000--more than the usual amount of \$800,000. In the past, some 70 percent was for canned mackerel-pike, about 20 percent for tuna canned in oil, and about 10 percent for "horse-mackerel" and common mackerel. This time, since light-meat tuna in oil is almost unobtainable and production of "horse mackerel" is short, possibly about 90 percent of the licensed amount will be for canned mackerel-pike.

Accordingly, exports of mackerel-pike of 100,000-120,000 cases are expected for Egypt and the Japanese exporters want to stabilize sales by putting a quantitative agreement into practice. If it is impossible, they desire to conclude a price agreement only and this is being studied by a committee organized for that purpose. (Suisan Tsushin, September 7, 1960.)

German Federal Republic

FISH-MEAL PRODUCTION, FOREIGN TRADE, AND CONSUMPTION:

Production: Fish-meal production in Western Germany increased from 83,100 metric tons in 1958/59 to 94,000 tons in 1959/60 (July 1959-June 1960), with herring meal showing the greatest increase.

Foreign Trade: Imports of fish meal increased from 140,800 tons in 1958/59 to 179,200 tons in 1959/60, while exports remained fairly constant at 9,000 and 9,500 tons, respectively. During 1958/59 Peru supplied 41 percent of the fish meal imports, but in 1959/60 that country supplied 72 percent. In the first half of 1959, fish meal imports were 79,000 tons; the same amount was imported the second half of 1959. But in January-June 1960 they climbed to 100,000 tons.

Consumption and Stocks: It is anticipated that fish-meal consumption will rise sharply by the end of 1960 (see table 1).

The increased domestic production and imports of fish meal are being absorbed by the large production of hogs

Table 1 - Western Germany's 1/Supply and Distribution of Fish Meal, 1958-60

	1959/60	1958/59
	... (Metric Tons) ...	
Stocks beginning of year 2/...	3,700	4,700
Production (In plants with more than 10 employees):		
Cod meal 3/.....	15,800	14,000
Fish meal 3/.....	52,500	48,300
Herring meal 3/.....	22,100	16,800
Total large plant production ..	90,400	79,100
Other production 4/.....	4,500	4,000
Grand total production	94,900	83,100
Imports	5/ 179,200	5/ 140,800
Total Supply	277,800	223,600
Exports	9,500	9,000
Consumption	261,400	215,900
Stocks 6/	6,900	3,700
1/ Includes West Berlin; and Saarland since July 1959.		
2/ At beginning of year in hands of fish-meal industry.		
3/ Requirements:		
	Minimum	Maximum
	Protein	Ca Phosphate
	..... (Percent)	
Cod meal	60	18
Fish meal	55	15
Herring meal	55	8
4/ Includes meal from shrimp waste.		
5/ Peru supplied 129,300 tons in 1958/60 and 57,400 tons in 1958/59.		
6/ End of year.		

and increased poultry production. But because fish meal prices in the first half of 1960 were so low and oil cake prices high, there no longer is an incentive to substitute vegetable protein for animal protein. (U. S. Foreign Agricultural Service Report, Bonn, October 4, 1960.)

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FOREIGN TRADE IN MARINE-ANIMAL OILS, 1958-1959:

Exports: Marine oil exports (fish, fish-liver, whale, etc.) from West Germany increased from 20,100 metric tons in 1958 to 33,400 tons in 1959. While only 60 percent of the 1958 exports were edible marine oils (fish, fish-liver, and whale), 96 percent of the 1959 exports were edible.

Table 1 - West Germany's Exports of Marine-Animal Oils, By Type, 1958-1959

Type	1959	1958
	... (Metric Tons) ...	
Edible:		
Marine and similar fats	6,000	4,800
Other marine fats & oils	26,000	7,200
Total	32,000	12,000
Industrial:		
Whale oil and fat	100	300
Other marine fats & oils	1,300	7,800
Total 1/	1,400	8,100
Grand Total	33,400	20,100
1/ Does not include industrial-use marine fatty acid exports-- 3,200 tons in 1959 and 2,200 tons in 1958.		

Norway buys the greater part of Germany's marine oils, with Denmark and Sweden receiving lesser yet significant amounts. The United States buys no marine oils from West Germany.

Imports: Imports of edible marine oils (fish, fish-liver, whale, etc.) into West Germany decreased from 129,100 metric tons to 121,900 tons in 1959. Smaller require-

Table 2 - West Germany's Imports of Marine-Animal Oils, By Type, 1958-1959

Type	1959	1958
	... (Metric Tons) ...	
Edible:		
Whale oil	67,800	70,500
Other marine oils	54,100	58,600
Total	121,900	129,100
Industrial:		
Whale oil and fat	12,200	8,300
Other marine oils & fats	10,900	5,700
Total 1/	23,100	14,000
Grand Total 2/	145,000	143,100
1/ Does not include industrial-use marine fatty acid imports-- 8,500 tons in 1959 and 9,000 tons in 1958.		
2/ Evidently does not include fish-liver oils and degreas (tanning fat of marine origin).		

ments in the margarine industry caused this decline. Industrial marine-oil imports increased from 14,000 tons in 1958 to 23,000 tons in 1959.

In 1958 West Germany received 21,300 tons of fish oil from the United States out of a total of 64,300 tons imported. This compared with 22,000 tons from the United States in 1959 out of a total of 65,000 tons.

German Federal Republic (Contd.):

Table 3 - West Germany's Imports of Marine-Animal Oils, By Type and Country of Origin, 1959

Type and Origin	Quantity
	Metric Tons
Fish-Liver Oils:	
Denmark	372
Iceland	402
Norway	466
Others	446
Total	1,686
Whale Oil and Whale Fat:	
United Kingdom	1,626
Iceland	507
Holland	3,218
Norway	36,068
Portugal	1,219
Union of South Africa, etc.	310
United States	871
Peru	3,409
Japan	29,785
Australia	2,617
Others	341
Total	79,371
Other Marine Fats and Oils:	
Belgium	394
Denmark	6,169
United Kingdom	689
Holland	3,838
Norway	7,297
Portugal	3,341
Sweden	319
Angola	4,371
Morocco	511
Union of South Africa, etc.	1,198
Canada	1,549
United States	21,986
Peru	8,833
Japan	3,790
For re-export	530
Others	199
Total	65,014
Deerast/:	
Holland	314
Sperm Oil:	
Destination not given	17
Grand Total	147,002
1/Tanning fat of marine origin.	

Norway, Japan, and the United States are the primary suppliers of marine oils to West Germany. (U. S. Foreign Agricultural Service Report, Bonn, April 14, 1960.)

IMPORTS, EXPORTS, AND PRODUCTION OF EDIBLE FISH OILS, 1957-59:

The shrinking West German market for edible fish oil (not including fish-liver oil, whale oil, etc.) has been accompanied over the past few years by slowly declining imports and sharply increasing exports. Trade sources say that lessening domestic demand has resulted mostly from a growing consumer preference for margarine made of vegetable fats and oils. Prices of imported edible fish oil dropped an average of 20.3 percent during 1957 through 1959. (See table 1.)

West German production of fish oil, after declining to 19,193 metric tons in 1958, rose again to 25,065 tons in 1959. This increase was attributed primarily to the availability of more raw material as a result of the higher percentage of fish declared unfit for human consumption in 1959. In addition, fish oil production aboard West German trawlers continued to increase. In 1957 production amounted to 21,155 tons. (It is estimated that West Germany produced an additional 6,000 tons of cod-liver oil in 1959. Almost 70 percent of that production went into medical and veterinarian uses. The remaining 30 percent was exported, primarily for vitamin extraction. An insignificant amount was used for margarine.)

Trade sources estimate that approximately 95 percent of the West German 1959 production of edible fish oil was exported. Exports increased from 7,236 tons in 1958 to 25,985 tons in 1959. Several reasons have been given for this development.

In the first place, the Scandinavian countries and the Netherlands were willing to pay more for West German fish oil than West German margarine manufacturers were. Norway took nearly 56 percent of West German fish oil exports in 1959, reportedly because (a) its own production dropped considerably, and (b) an estimated 60 percent of the Norwegian output was exported under a long-term contract to Russia. (See table 2.)

West German imports of edible fish oil during the past three years declined steadily but slowly, from 59,383 tons in 1957 to 54,465 tons in 1959. The pattern of imports during these three years changed significantly. Imports from Iceland, Angola, and the Union of South Africa dropped considerably, while Denmark, the Netherlands, Peru, and Japan developed into volume suppliers. Most of the change in the import pattern is ascribed to the relatively lower prices at which edible fish oil was offered by the latter group of countries.

Throughout the past three years, the United States continued to account for the biggest share in West German imports. After a drop from 28,527 tons, or 48 percent of total West German edible fish oil imports in 1957, to 21,294 tons, or 37 percent in 1958, United States shipments increased again to 21,986 tons or 40.4 percent in 1959. However, United States fish oil managed to maintain its leading position in the West German fish oil

German Federal Republic (Contd.):

market only through a 20 percent reduction in its prices during the past three years. (See table 3.)

many is said to have developed a decided preference for United States menhaden oil, to the processing of which it has become accustomed.

Table 1 - West Germany's Imports of Edible Fish Oils^{1/} by Country of Origin, 1957-59

Country	Quantity			Value ^{2/}					
	1959	1958	1957	1959		1958		1957	
	(Metric Tons)			DM1,000	US\$1,000	DM1,000	US\$1,000	DM1,000	US\$1,000
Denmark	4,827	2,041	1,059	3,519	838	1,513	362	937	223
Great Britain	508	508	-	410	98	394	94	-	-
Iceland	251	7,464	5,463	198	47	6,092	1,450	4,871	1,160
Netherlands	3,329	2,489	1,585	2,291	545	1,839	438	1,353	322
Norway	5,296	6,233	5,687	4,477	1,066	5,757	1,371	6,212	1,479
Portugal	1,286	759	900	911	217	589	140	851	203
Angola	2,891	5,641	9,423	2,149	512	4,254	1,013	8,310	1,979
Morocco	255	151	-	156	37	111	26	-	-
Union of South Africa	1,199	9,241	4,664	844	201	6,836	1,628	4,020	957
Canada	1,549	1,645	411	1,190	283	1,342	320	412	98
United States	21,986	21,294	28,527	16,145	3,844	17,188	4,092	26,247	6,249
Panama	-	-	239	-	-	-	-	209	50
Peru	7,098	-	1,136	4,543	1,082	-	-	1,011	241
Japan	3,790	-	25	2,968	707	-	-	20	5
Other	200	86	264	162	39	64	15	247	59
Total	54,465	57,552	59,383	39,963	9,516	45,979	10,949	54,700	13,025

1/Exclusive of fish-liver oil, whale oil, and other marine oils.

2/Values converted to US\$ at rate of DM4.20 equals US\$1.

Prospects for imported edible fish oil in the West German market are difficult to judge. The marketing potentiality of foreign oil would seem to depend to a considerable

From a long term point of view, competition between domestic and foreign fish oil suppliers in the West German market is expected to become keener, not only because

Table 2 - West Germany's Exports of Edible Fish Oils^{1/}, 1957-59

Country	Quantity			Value ^{2/}					
	1959	1958	1957	1959		1958		1957	
	(Metric Tons)			DM1,000	US\$1,000	DM1,000	US\$1,000	DM1,000	US\$1,000
Denmark	4,209	3,556	989	3,118	742	2,752	655	882	210
Netherlands	2,561	1,596	1,541	1,874	446	1,244	296	1,423	339
Austria	-	-	19	-	-	-	-	23	5
Norway	14,672	1,070	-	10,397	2,475	787	187	-	-
Sweden	4,543	1,014	1,703	3,301	786	874	208	1,558	371
Total	25,985	7,236	4,252	18,690	4,449	5,657	1,346	3,886	925

1/Exclusive of fish-liver oil, whale oil, and other marine oils.

2/Values converted to US\$ at rate of DM4.20 equals US\$1.

extent on the possibility of German fish oil finding a market abroad. This involves such imponderables as (1) the size of the fish catches in countries now buying German edible fish oil, (2) the development of consumer preferences with regard to consumption of butter and of higher quality vegetable margarine, and (3) in the case of Norway, continued exports of fish oil to Russia.

German trade sources like to think that, at least in the coming few years, their sales of fish oil abroad will continue to be high. Consequently, they expect West German needs for imported fish oil to remain high, although declining slowly. It is predicted that United States menhaden oil will continue to account for a major percentage of overall West German fish oil imports. A leading margarine-producing company in West Ger-

Table 3 - Average Imports, Exports, and Ex-Plant Prices in West Germany for Edible Fish Oils, 1957-59

Country of Origin	Average Prices for Imports C.I.F. German Border Points					
	1959	1958	1957	1959	1958	1957
	DM Per Metric Ton	DM Per Metric Ton	DM Per Metric Ton	US\$ Per Metric Ton	US\$ Per Metric Ton	US\$ Per Metric Ton
Denmark	729	741	885	173.57	176.43	210.71
Iceland	790	816	892	188.10	194.29	212.38
Netherlands	688	739	854	163.81	175.95	203.33
Norway	845	924	1,092	201.19	220.00	260.00
Angola	743	754	882	176.99	179.52	210.00
Union of So. Africa	704	740	862	167.62	176.19	205.24
Canada	768	816	1,003	182.86	194.29	238.80
United States	734	807	920	174.76	192.14	219.05
Peru	640	-	890	152.38	-	211.90
Japan	783	-	787	186.43	-	187.38
Country of Destination	Average Prices for Exports F.O.B. German Border Points					
Denmark	741	774	892	176.43	184.29	212.38
Netherlands	732	779	924	174.29	185.47	220.00
Austria	-	-	1,198	-	-	285.23
Norway	709	735	-	168.81	175.00	-
Sweden	727	862	915	173.10	205.24	217.86
Average Ex-Plant Prices for Domestic Production						
Total Production	698	740	833	166.19	176.19	198.33

German Federal Republic (Contd.):

the demand for fish oil by the margarine industries at home and abroad is expected to decline progressively, but also because foreign suppliers will probably step up their own production. Trade sources have pointed out that Russia is rapidly expanding its fisheries, and that it may ultimately buy less Norwegian fish oil. In that event, German producers would try to find a greater outlet in the home market. Moreover, increased competition is expected from less developed countries which cannot easily channel their growing fish catches into human consumption because of a lack of processing and distribution facilities. For these countries, the reduction of fish to oil and meal is the easiest way of utilizing their catches, and, according

to local trade sources, their low production costs can have a depressing effect on edible fish oil prices. (United States Consulate in Bremen, May 17, 1960.)

* * * * *

FUNDS FOR THE SUPPORT OF THE FISHING INDUSTRY:

Appropriations and expenditures by the West German Federal Government for the support of the commercial fishing industry amounted to DM17.2 million (US\$4.1 million) and DM10.7 million (US\$2.6 million), respectively, for the fiscal year ending March 31, 1960. Beginning with April 1, 1960, the fiscal year April-March was changed to a calendar year and funds amounting to DM13.2 million (US\$3.2 million) were appropriated for a transitional nine months period.

Appropriations and Actual Expenditures by the West German Government for the Support of the Fishing Industry, Fiscal Year 1959/60 and April-December 1960

Purpose	Fiscal Year 1959/60 ^{1/}				Fiscal Year 1960 ^{2/}	
	Appropriations		Actual Expenditures		Appropriations	
	DM1,000	US\$1,000	DM1,000	US\$1,000	DM1,000	US\$1,000
(1) Subsidy on Diesel fuel used by luggers and cutters	4,000	959	3,300	791	2,625	629
(2) Temporary special support program for the lugger and cutter fisheries in the form of medium term loans	480	115	429	103	-	-
(3) Revolving loan fund to aid in the construction and modernization of cutters	350	84	NA	NA	200	48
(Total amount of revolving fund)	(5,000)	(1,199)	NA	NA	(5,200)	(1,247)
(4) Loans from the amortization of ERP investments in West Germany for the construction of factory trawlers	6,000	1,439	NA	NA	5,200	1,247
(5) a. Subsidy of interest rates on commercial loans for the construction and modernization of luggers, cutters and factory trawlers	400	96	355	85	225	54
b. Subsidy of interest rates on commercial loans for the building of central freezing and distribution facilities	100	24	NA	NA	-	-
c. Subsidy of interest rates to avoid financial distress to trawler companies forced to convert from interest-free to interest-bearing commercial loans	100	24	NA	NA	-	-
(6) Management Advice Program for the cutter fishing trade	100	24	91	22	150	36
(7) Search for and exploration of new fishing grounds and improvement of catching techniques	800	192	NA	NA	830	199
(8) Contribution to the German Scientific Commission for the Exploration of the Seas, Bonn	150	36	151	36	169	40
(9) Operation and maintenance of the fishery research vessel Anton Dohrn	805	193	688	165	563	135
(10) Federal Fisheries Research Institute, Hamburg	1,967	472	3,318	796	1,894	454
thereof: a. construction of a new building for the Institute ^{4/}	(300)	(72)	3(1,383)	(332)	(743)	(178)
b. construction of a new building for the Biological Institute, Helgoland ^{5/}	-	-	3/627	150	-	-
c. testing of fish products	(9)	(2)	NA	NA	(6)	(1)
(11) Operation and maintenance of the Federal Fisheries Policing and Protection Service, consisting of 3 vessels	1,941	465	1,701	408	1,339	321
(12) Contribution to international organizations:						
a. International Council for the Exploration of the Seas, Copenhagen	24	6	24	6	30	7
b. Overfishing Convention of 1946, London	3	1	3	1	3	1
c. International Council for North Atlantic Fisheries	10	2	9	2	17	4
Total	17,230	4,132	10,697	2,565	13,245	3,175

^{1/}April 1-March 31.

^{2/}April 1-December 31. In 1960 the German Government changed its fiscal year to a calendar-year basis, and the 1960 fiscal year became a transitional year covering a period of 9 months.

^{3/}Expenditures in excess of appropriations in 1959/60 were made possible by surplus funds from appropriations made in previous years.

^{4/}Total cost of the project: DM4,449,000 (US\$1,066,900).

^{5/}Total cost of the project: DM4,700,000 (US\$1,127,090).

NA = Not available.

Note: 4.170 Deutsche marks equal US\$1.

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German Federal Republic (Contd.):

NEW TYPE CANNED FISH CONTAINER DEVELOPED:

A leading fishing and canning firm of Bremerhaven, West Germany, recently started selling its canned fishery products in a new type of container developed by a firm located in Hannover.

The innovation in this new type of container is the lid construction. Rather than soldering or crimping the lid on top of the can, the processor places it on a rubber ring fitted on the rim, and it is held in place by a partial vacuum. The procedure is similar to the way housewives preserve food in glass jars. The can is opened easily by pulling a small tongue attached to the rubber ring and protruding from under the top.

Containers of a similar construction have been on the German market for some time, but can be used only for fish products prepared with chemical preservatives and permit storage only for a short period. The Hannover firm succeeded in solving the problem of adapting the rubber ring to form a better seal that will last over a long-term storage period. Reportedly, a patent has been obtained on this invention.

Some experts were quoted as saying that the new container will revolutionize canning procedures, states a dispatch from the United States Consul in Bremen.

**Hong Kong****SHRIMP EXPORTS AND RE-EXPORTS, 1952-1959 AND JANUARY-JUNE 1960:**

Shrimp exports by Hong Kong to the United States reached a peak of about 4.1 million pounds in 1958 and dropped off rapidly in 1959 following the ban on shrimp imports from Hong Kong to the United States that be-

	Total Exports	Exports to U. S.	Total Re-Exports ^{2/}	Re-Exports to U. S.
	(1,000 Lbs.)			
January-June 1960	164.5	-	886.8	-
1959	828.0	514.4	2,013.0	-

^{1/}Beginning January 1, 1959, shrimp are listed separately in export statistics.
^{2/}Includes shrimp imported into Hong Kong from Communist China and re-exported.

came effective on June 17, 1959. The ban on shrimp exported to the United States from Hong Kong was imposed because the Hong Kong shrimp exports included a large percentage of shrimp produced in Communist China.

	1958	1957	1956	1955	1954	1953	1952
Total	6,559.1	2,975.3	1,667.5	1,410.1	44.7	7.8	37.5
To United States	4,139.0	1,560.2	578.3	67.2	-	-	-

Note: Prior to January 1, 1959, exports of shrimp were included in basket category "crustacea and molluscs, fresh, chilled, and frozen."

In addition, the ban on shrimp exports from Hong Kong to the United States has affected the sale of shrimp landings through the Government Fisheries Marketing Organization. During April 1958-March 1959 more than 4.9 million pounds of shrimp were marketed through that Organization in contrast to only about 1.1 million pounds for the fiscal year ending March 31, 1960. Due to the export ban to the United States, most of the shrimp landed by Hong Kong fishermen or imported from Communist China by-passed the Marketing Organization and were sold in various large retail markets in Hong Kong and Kowloon.

It is estimated that Hong Kong shrimp fishermen are capable of landing about 4.5 million pounds (exclusive of shrimp from the China mainland). Most of this production is consumed locally and potential exports of Hong Kong-caught shrimp are estimated to be about 1 million pounds. (U. S. Consul in Hong Kong, September 22, 1960.)

April 1959 - March 1960	April 1958 - March 1959	June 1957 - March 1958
1,149.1	4,930.5	3,864.4

**Iceland****EX-VESSEL PRICE FOR SOUTH COAST HERRING HIGHER:**

The price to be paid by Icelandic processors to drift-net herring vessels for the south coast herring catch was announced September 21, 1960. The price is 1.80 Icelandic kronur per kilogram (2.15 U. S. cents a pound) for herring for salting and freezing, compared with 1.60 kronur (2 U. S. cents a pound) last year.

This increase will give a greater premium to processing of the catch for salting and

Iceland (Contd.):

freezing rather than for rendering into meal and oil. The Herring Production Board has been criticized by the Communist press for not directing a larger proportion of the summer herring catch for salting. Some salted herring contracts with Eastern European countries could not be filled. It may be possible to complete certain of them with south coast herring.

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FISHERIES TRENDS.

SECOND QUARTER 1960:

Total landings from the Icelandic cod fisheries during the first half of 1960 increased to 198,246 metric tons from about 180,000 tons for the same period of 1959. The total catch of all species rose to 296,629 metric tons during the first half of 1960 from about 259,000 tons for the same period of 1959.

Table 1 - Icelandic Fishery Landings by Principle Species, January-June 1958-60

Species	January-June		
	1960	1959	1958
	(Metric Tons/l)		
Cod	198,246	179,893	199,746
Haddock	17,776	10,403	13,147
Saithe	4,246	6,004	7,136
Ling	3,953	1,542	2,815
Wolfish (catfish)	6,639	7,697	8,351
Cusk	5,223	2,270	4,089
Ocean perch	18,002	42,740	18,399
Halibut	775	474	523
Flounders	402	497	498
Herring	39,732	6,104	24,675
Other	1,635	1,375	1,207
Total	296,629	258,999	280,586

1/Weights are gutted fish with heads on, except herring which are whole or round.

The value of the catch was up sharply due to better landings of the more valuable cod, haddock, and herring. The only notable decline was in the ocean perch landings. Ocean perch is a less valuable product per pound and is shipped mostly to the Soviet Union. The slump in the summer herring season was not registered until July, and was not reflected in landings for the first six months of 1960. The increase in cod landings was partly due to concentration on this kind of fishing and to the failure of the ocean perch fishery, as well as the good prices received by some trawlers in selling fresh cod and haddock on ice in England. The motor fishing vessels had relatively good fishing for cod in Icelandic waters, partly as a result of the general absence of foreign and Icelandic trawlers from the 12-mile limits area. Icelandic trawlers and motor boats benefit-

ed when British trawlers agreed to remain outside the 12-mile limit from the Law of the Sea Conference in May 1960 in Geneva until the middle of July and then until the middle of October.

During the January-June 1960 period there was a marked trend toward free world markets. A larger proportion of the catch was processed by air-drying and salting rather than freezing. The Soviet Union and satellites import frozen rather than dried and salted fish. Based on its estimate of the quality of the north coast herring catch, the Herring Production Board permitted only a relatively small proportion to be salted. The lion's share went for fish meal and oil, for which the world market prices are very low.

Table 2 - Icelandic Fishery Catch by Type of Vessel, January-June 1958-60

Type Vessel	January-June		
	1960	1959	1958
	(Metric Tons/l)		
Motorboats	239,840	182,257	192,206
Trawlers	56,789	76,742	88,380
Total	296,629	258,999	280,586

1/All weights are of gutted fish with heads on, except herring which are whole.

The dramatic decline in the proportion of the landings by trawlers, as compared with the motorboats, continued during the first half of 1960 when the trawlers accounted for only 19.1 percent of the landings as compared with 29.6 percent during the first half of 1959, and 39.1 percent during the first half of 1956. The build-up by delivery of new vessels to both the trawler and motor boat fishing fleets continued during the quarter. There was also great activity in equipping the motor vessels for the north coast herring fishery with new nylon nets, new retrieving gear, and new electronic equipment, the United States Embassy in Reykjavik reported on September 30, 1960.



India

JAPANESE TO AID IN DEVELOPMENT OF FISHERIES:

Two fishery development projects to be undertaken with Japanese collaboration have been approved by the Indian Government for inclusion under the US\$50 million credit agreement between India and Japan signed on February 4, 1958. A large Japanese fishing company will collaborate with an Indian company in shrimp fishery operations at Cochin.

India (Contd.):

The second project involves a survey of the Mangalore coast in Mysore State. Other Japanese firms are reported to be negotiating with Indian companies for the formation of joint ventures for fishing operations, ice-making, cold-storage and canning plants, and the manufacture of fish nets.

The projects appear to be the direct outcome of India's increased interest in exploitation of the considerable fishery resources along the Indian coast and in the Indian Ocean and the resultant visit to Japan in March 1960 of a three-member team of Indian officials. The Japanese offers indicate that the conditions set down by the Indian Government for foreign participation in Indian fishery operations have not seriously handicapped negotiations for foreign collaboration. (United States Embassy, New Delhi, October 8, 1960)

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SHRIMP PRODUCTION AND FOREIGN TRADE, 1959:

In 1959, India produced 27,632 metric tons of penaeid shrimp and 37,805 tons of non-penaeid shrimp.

The three most important varieties of fish and shellfish exported by India in 1959 were dry-unsalted "bomlas," dry-salted fish, and shrimp (frozen, dried, and canned). India's total shrimp exports were valued at 15 million rupees (US\$3.15 million) in 1959; the United States received an amount valued at 4.6 million rupees (US\$966,000), or 30.7 percent of the total and Burma came next with 4.3 million rupees (US\$903,000). The other principal countries buying shrimp from India in 1959 were Ceylon, Hong Kong, and France. (United States Embassy, New Delhi, October 5, 1960.)

**Israel****FISHING INDUSTRY SUFFERS REVERSES:**

The uncertain situation prevailing in the Israel's deep-sea fishing industry was underlined during August 1960 by the news that only 12 Israeli trawlers were operating in 1960 in the Mediterranean, as compared with about 24 in 1959. Several of the trawlers thus displaced were transferred to the Red Sea, and others were reportedly ear-

marked for fishing in the Persian Gulf. This will not prevent, however, at least three of the vessels from being laid-up entirely.

In view of the large sums invested during recent years in expanding and improving the local fishing fleet, and the fact that several additional trawlers are now on order abroad, this development calls for some explanation. A partial one is found in the recent suspension of fishing near Turkish waters, following a number of incidents involving the impounding of Israeli trawlers by Turkish coast-guard vessels on the grounds of their having entered Turkish territorial waters. But the fact must be faced that the Eastern Mediterranean as a whole is not over-endowed with fishery resources. Any further expansion of deep-sea fishing will thus be dependent on the dispatch of Israeli vessels to more distant grounds. Two large trawlers designed for ocean fishing on order were expected to arrive late in 1960.

A crucial consideration would appear to be the fact that, despite the large population increase in the interval, the total quantity of fish marketed in Israel fell by approximately 18 percent between 1954 and 1959. This marked decline in per capita consumption has not, of course, been the result of the development of a sudden aversion to fish as such, but of the improved food situation in general. In 1954, eggs, meat, poultry, and milk products were scarce and relatively expensive. Today the supply position has improved and prices are, with few exceptions, within the reach of all. The brunt of the decline in fish consumption has been borne by imports, which declined from some 15,000 tons in 1954 to under 7,000 tons in 1959. Well over half of these latter imports were hering in brine, i.e. were noncompetitive as far as the local fish landings are concerned. The total marketing in 1959 was about 19,500 metric tons and the importance of competitive imports (mainly frozen fillets) is negligible. Any large-scale increase in the local Israeli's landings will have to be taken up almost entirely, therefore, by increased per capita consumption. Whether such an increase in consumption can reasonably be anticipated must be regarded as at least a matter of conjecture.

Therefore, before any further decisions are taken involving the allocation of additional funds for investment in fisheries, a thorough study needs to be made of present and probable future demand for fish and fish products--

Israel (Contd.):

against the background of known plans regarding agricultural production and the establishment of new food industries. Should such an investigation indicate the existence of potential additional demand, the next step would be to carry out a survey of likely fishing grounds and to estimate the economic future of long-range ocean fishing, taking into account both the transportation costs involved and the prices likely to be realized in the Israeli market. (The Israel Economist, August 1960.)



Italy

FISH-BODY OIL PRICES AS OF SEPTEMBER 1960:

The September 1960 prices of the basic three types of fish-body oil (excluding whale oil and seal oil) which are of interest to the Italian Market are as follows according to a Genoa importer:

(a) Herring oil, straw-colored, filtered, 0.5 to 1 percent acidity; Norwegian kroner 150 per 100 kilos (about US\$210 a metric ton or 9.53 U. S. cents a pound), net weight c.i.f. Genoa (no charge for containers, i. e., steel drums).

(b) Not specified fish-body oil, light ruby colored, filtered, 10 percent acidity; Norwegian kroner 130 per 100 kilos (about US\$182 a metric ton or 8.26 U. S. cents a pound), net weight, c.i.f. Genoa (no charge for containers, i. e., steel drums).

(c) Not specified fish-body oil, dark ruby colored, filtered, 30 to 40 percent acidity; Norwegian kroner 90 per 100 kilos (about US\$126 a metric ton or 5.72 U. S. cents a pound), net weight, c.i.f. Genoa (no charge for containers, i. e., steel drums).

The Genoa importer stated that there are a great number of different kinds of fish-body oil which are imported, but gathering prices for all of them would be really impractical. Importers supply themselves generally from Norway.

The importer stated that in Italy no customs duties are levied on fish-body oils; however, he said that other costs should be taken into account to obtain the actual cost

at the Port of Genoa, for customs-cleared goods. Other costs are unloading expenses, freight-forwarder assistance cost, statistical duties, exchange tax, and other costs. In general, importers figure that the c.i.f. cost should be increased by 10 lire per kilo (about \$16.11 a metric ton), as an over-all estimate of such charges, the United States Embassy in Rome reported September 22, 1960.

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TUNA IMPORTS AND THE COMMON MARKET:

The present Italian import duty on fresh or frozen tuna is 20 percent on the invoice price. This product is listed under fresh and frozen fish (Italian Customs Item EX-03,01-B-1b). The proposed European Economic Community (EEC) or Common Market rate is 25 percent, the first step to achieve this rate to be effective December 31, 1960. In applying the 25-percent duty to each of the Common Market countries, the following formula is to be used:

1. If the national rate is within 15 percent of EEC's 25-percent rate, the national tariff will be increased or decreased to 25 percent.
2. If the national tariff is more than 15 percent of EEC's 25-percent rate, the national tariff shall be reduced or increased by 30 percent of the difference between the EEC duty and the national duty.

Revisions in national tariffs will be made every four years until the uniform EEC rate is attained. EEC, however, is planning to accelerate these revisions.

Italian officials, on the basis of Article 25, paragraph 3, of the Rome Treaty, had requested of the EEC Commission that it be given a duty-free quota, no limit, on imports of fresh and frozen tuna. This request was possible because tuna is listed in Annex II, G List, of the Treaty under agricultural products.

On March 2, 1960, an Accord was signed at Rome which would permit Italy to import "Sea Fish, Fresh, Refrigerated, or Frozen, whole, headed, or cut into pieces" free of duty, quantities unlimited. This Accord, in accordance with the Treaty's definition of customs duties relating to products on the "G" list, provides that EEC countries may ask authorization to import new lots of fish if it can be justified that the current trade in a product should be conducted in the traditional manner to the advantage of consumers and industries. In the case of tuna, the frozen product is required to provide Italian canning plants with raw materials.

The March 2 Accord has no termination date and is supposed to be effective December 31, 1960. At first France objected to the Accord but withdrew its objections and the Accord was signed. The Accord permits other countries of the EEC to apply to the Commission for a duty-free quota but so far no other countries have submitted a request.

Italian officials stated that the Accord cannot come into force, or the proposed 25-percent tariff applied, until new provisions for a common agriculture policy have been determined. Therefore, as far as Italy is concerned the 20-percent national duty on fresh and frozen tuna remains in force until such policy is determined.

Besides the import duty, Italy has a number of national taxes applied both to domestically-produced products and to imports of fresh or frozen tuna. These are as follows:

1. A 0.2-percent tax applied on the invoice price, this tax to be used for research.
2. A 0.05-percent tax for administration expenses.

Italy (Contd.):

3. A 3.3-percent tax applied on all transactions. In effect this means that every time a product changes hands, this tax is collected both on imports and on domestically-produced tuna.

4. In the case of duty-free imports (as would be the case if the EEC Accord on fresh or frozen sea fish becomes effective), there would be a tax of 20 percent on the invoice price. Thus, the proposed duty-free tuna imports would be subject to a tax equivalent to the present import duty.

In the case of imports of canned tuna into Italy, the general rate is 40 percent, but this has been temporarily reduced to 27 percent. The proposed Common Market rate is to be 25 percent. According to a new decision of the EEC Council, the EEC duty will be reduced to 20 percent in order to foster increased international trade in this product. This decision was made May 11, 1960. It is proposed that the first reduction to achieve the uniform rate will be effective December 31, 1960, providing that (as in the case of fresh and frozen tuna) provisions for a common agriculture policy will have been determined.

Origin	Quantity			
	Jan.-June 1960	1959	1958	1957
	.....(Metric Tons).....			
Japan ^{2/}	14,434	18,079	13,599	9,560
Other	16,713	33,621	32,503	33,465
Total	31,147	51,700	46,102	43,025
	Value			
	.....(US\$1,000).....			
Japan	4,115	5,205	3,591	2,873
Other	6,495	10,395	11,878	11,689
Total	10,610	15,600	15,469	14,562

^{1/}Includes salt-water fish only and not otherwise specified.

^{2/}Believed to be almost entirely frozen tuna.

Values in lire converted to US\$ at rate of 620.6 lire equal US\$1 for January-June 1960 and 1959, 624.0 lire equal US\$1 for 1958, and 624.89 lire equal US\$1 for 1957.

Since the Italian duty of 27 percent on canned tuna will eventually be reduced to 20 percent, the first reduction will be 30 percent of the difference between the present and the uniform rate, thus bringing the Italian duty down to 24.9 percent on December 31, 1960. The second 30-percent reduction is planned for four years later, but under the proposed acceleration plan it may come sooner.

Besides the research, administrative, and transaction taxes mentioned above for fresh and frozen tuna, there is a 65-lire tax on each kilogram (about 0.5 U. S. cents a pound) of oil in canned tuna.

Italian needs for tuna are estimated to be at least 20,000 metric tons annually. Italian production, however, has averaged only about 2,500 tons annually (2,877 tons in 1957, 2,985 tons in 1958, and 2,064 tons in 1959). The rest of the tuna supply comes principally from Japanese landings at Italian ports.

The price of the imported tuna, c.i.f. Italy, has ranged between 160 and 180 lire per kilogram (about US\$234-263 a short ton). Price as of September was about 177 lire per kilogram (about US\$259 a short ton) for frozen tuna.



Japan

EXPORTS OF CANNED TUNA (EXCLUDING TUNA IN BRINE), 1956-59:

Exports of canned tuna by Japan, exclusive of canned tuna in brine, in 1959 totaled 1,400,172 cases or about 25.7 percent higher than the average exports of 1,114,238 cases for the 1956-59 period. From 1956 to 1959 there was a sharp increase in exports of canned tuna in oil to "other" countries. In 1959, West Germany was Japan's best customer for canned tuna in oil, accounting for about 30 percent of the total. Canada and Switzerland were also important buyers of Japanese canned tuna in oil during the 1956-59 period.

	1959	1958	1957	1956
Exports by Country of Destination (Cases)				
West Germany	420,710	287,729	255,656	146,598
Canada	155,869	148,888	141,927	130,330
Switzerland	107,030	77,104	111,277	136,733
The Netherlands	45,204	33,146	51,970	62,512
Belgium	89,259	69,582	73,152	85,581
Britain	74,740	58,051	73,765	23
Saudi Arabia	72,335	50,146	52,082	24,234
Lebanon	68,065	22,756	59,357	27,433
Italy	46,280	37,330	152,486	77,653
Others	320,680	156,574	249,472	203,234
Total	1,400,172	941,306	1,221,144	894,331
Exports by type of product:				
In oil	1,375,401	881,437	1,197,448	887,521
Other than oil or brine	24,771	59,869	23,696	6,810

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EXPORTS OF CANNED FISHERY PRODUCTS, JANUARY-MAY 1959-60:

Product	1960 January-May			1959 Jan.-May
	United States	Canada	Other Countries	Total
	.....(Cases) ¹			
Crab	26,923	648	58,803	86,274
Tuna:				
In oil	-	73,702	518,329	592,031
In brine	802,039	-	-	802,039
Other	100	2,251	29,130	31,481
Total Canned Tuna	802,139	75,953	547,459	1,425,551
Mackerel-pike	5,663	1,730	526,953	534,346
Sardine	288	-	349,183	349,471
Salmon				
trout	65,464	154	236,961	302,579
Other fish	2,283	100	243,236	245,619
Shellfish	106,185	25,973	19,010	151,168
Other aquatic products	1,762	55	326	2,143
Total	1,010,607	104,613	1,981,931	3,097,151

Japan (Contd.):

Exports of canned fishery products by Japan during the first five months of 1960 amounted to 3,097,151 cases or about 1.0 percent less than the 3,129,939 cases exported in the similar period of 1959. In the first five months of 1960 exports of canned tuna (oil, brine, and other) were up 13.2 percent, but canned crab and salmon exports were down sharply as compared with the January-May 1959 period.

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TUNA VESSELS OPERATING IN THE ATLANTIC OCEAN:

About 50 Japanese tuna vessels were operating in the Atlantic Ocean as of September 1960, and half of them transship their catches to the United States and Italy in addition to Yugoslavia and other countries. The Japanese Fisheries Agency intends to adjust tuna exports to Yugoslavia. Accordingly, future exports to Yugoslavia will be based on what that country alone can consume or use. (Fisheries Economic News, September 17, 1960.)

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IMPORT RESTRICTIONS REMOVED ON SOME FISHERY AND RELATED PRODUCTS:

The Japanese Ministry of International Trade and Industry on September 22, 1960, published a list of 74 commodities to be placed under the Automatic Approval and Automatic Fund Allocation Systems on October 1, 1960. This new list covers agricultural and aquatic products and is intended as a supplement to an earlier list of 57 items of a more general nature scheduled for inclusion on the same date.

Included in the list are the following fishery and related products: frog meat, fresh, chilled or frozen; breeding fish; fish roe, live; fish, live, n.e.s.; rainbow trout, fresh, chilled or frozen; abalone, fresh, chilled or frozen; abalone, salted or dried; seed oysters; oysters, fresh, chilled or frozen; oysters, salted or dried; crustacea, molluscs and the like, for breeding purposes (excluding oyster seed); crustacea, molluscs and the like, live (excluding for breeding purposes); fish, fish products, and fish preparations in airtight containers (including crustacea and molluscs but excluding salmon eggs); and fish rods of bamboo. (United States Embassy in Tokyo, September 28, 1960.)

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MARINE-OIL EXPORTS AND CONSUMPTION, 1958-59:

Total exports of marine-oils during 1959 by Japan amounted to 103,564 metric tons and are expected to increase to about 117,460 tons in 1960 (see table 1).

Type	1960/	1959
. . . (Metric Tons) . . .		
Edible:		
Cod-liver oil	1,520	1,368
Shark-liver oil	80	104
Fish-liver oil	1,600	1,338
Fish oil	260	482
Whale oil	90,000	81,280
Total	93,460	84,572
Inedible:		
Sperm oil	24,000	18,992
Grand Total	117,460	103,564

The larger part of Japan's production of marine oils is exported in the form of whale oil; however, considerable amounts of whale oil and fish oil are used in the domestic pro-

Table 2 - Japan's Utilization of Marine Oils, April 1, 1959-March 31, 1960

Type	Margarine & other Processing	Manufacturing Industry	Domestic Consumption	Exports	Total Production
. (Metric Tons).					
Whale oil	14,200	2,300	16,500	90,370	106,870
Fish oil	26,800	11,800	38,400	2,850	41,250
Sperm oil	-	33,300	33,300	1,600	34,900
Totals	40,800	47,400	88,200	94,820	183,020

duction of margarine. Inedible sperm oil is used extensively by other industries (see table 2). (U. S. Foreign Agricultural Service Report, September 28, 1960, Tokyo.)

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SALMON SHARK EXPORTS TO ITALY INCREASE SHARPLY:

Japanese salmon shark ("porbeagle") exports to Italy have increased sharply since last year. As of mid-September 1960, exports since January 1, 1960, had reached more than 1,000 metric tons, almost twice as much as last year. The price is \$320 a metric ton c.i.f., the same as last year. Although there are certain problems with quality, further expansion is expected if the quality of the product improves, since demand in the Italian market is estimated to be 2,000 tons a year.

The exports are used for steaks and the Japanese industry is said to be expecting much from this new product of the Kesennuma area in Miyagi Prefecture.

Japan (Contd.):

When the first order was received from Italy in 1957, exports were limited to about 50 tons a year under the agreement to ship salmon shark in return for Italy's rice and mercury exports, but later orders gradually increased.

This species of shark is abundant during the summer months and was previously bought by the Japanese makers of paste products almost at the buyer's price. This year, however, Japanese manufacturers were forced to pay the same prices that Italian importers paid and there is even a tendency for a shortage. More than 50 percent of the salmon shark caught on the Sanriku fishing grounds are landed at Kesennuma, and freezing the shark has become an important industry in that area. (Fisheries Economic News, September 21, 1960.)



Mexico

FOREIGN TRADE IN MARINE OILS:

Table 1 - Mexico's Imports of Marine Oils, January-July 1959-60		
Item and Origin	Jan.-July	Jan.-July
	1960	1959
	.. (Metric Tons) ..	
Fish Liver Oils:		
United States	-	-
Norway	70	81
Great Britain	-	7
Total	70	88
Cod Oils:		
United States	74	44
Norway	289	208
Great Britain	-	6
Germany	6	-
Total	369	258
Whale Oils:		
United States	33	18
Great Britain	36	4
Germany	15	8
Norway	18	13
Italy	-	3
Total	102	46
Fish Oils, Other:		
United States	0.3	13
Great Britain	3.0	11
Norway	2.0	15
Other Countries	0.4	-
Total	6.0	39
Total all Oils	547	431

Exports: During the first seven months of 1959 Mexico exported 75 metric tons of whale oil and 327 tons of fish oil to the United States, as compared with 68 tons of whale oil and 33 tons of fish oil for the same period of 1960. This represents a decline of 25.1 percent in volume of marine oils exported to the United States. The United States was the only buyer for Mexico's whale and fish oil.

Imports: Mexico's imports of marine oils from all countries increased from 431 tons during the first seven months of 1959 to 547 tons for the same period in 1960. Imports of cod oil and whale oil from the United States increased, while imports of other fish oils from the United States declined (see table 1). (U. S. Foreign Agricultural Service Report, Mexico City, September 30, 1960.)

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SHRIMP FISHERY TRENDS,
MID-SEPTEMBER 1960:

The price dispute between the shrimp fishermen's cooperative and the vessel owners at the Gulf of Mexico port of Ciudad del Carmen was settled on September 16, 1960. Separate agreements at other shrimp fishing ports or areas were reached earlier in the month. The agreements are for two years and expire on August 31, 1962.

Increases of 160 pesos per metric ton of headless shrimp (about 0.58 U. S. cents a pound) were agreed to for the west coast ports of San Felipe, Baja California, and Mazatlan, Sinaloa. The Guaymas price increased 225 pesos (about 0.82 U. S. cents a pound). In the above ports the increases cover all sizes of shrimp.

A new system, which has been prevailing in Ciudad del Carmen and Campeche, was introduced at Salina Cruz, Oaxaca. This consists in paying the fishermen more for large than for small shrimp. Shrimp counting 30 to the pound headless and under are considered large and 31 count and over are small. The fishermen will receive 3,500 pesos per metric ton (US\$280 a ton or 12.7 U.S. cents a pound) for large shrimp and 2,265 pesos a metric ton for small (US\$181.20 a metric ton or 8.2 cents a pound)^{1/2}. However, if the ex-vessel or price to the boat for small shrimp is more than 9,300 pesos a metric ton (\$74 a ton or 33.8 cents a pound), the same price (3,500 pesos or \$280 a ton) will be paid for small as for large shrimp.

At Ciudad del Carmen and Campeche changes consisted in the dropping of one deckhand; a lesser amount paid for small shrimp; an increase in the amount paid for large shrimp; an increase in food allowance, and fixed daily wages for the crew while a boat is on the ways for repairs.

The Gulf of California shrimp fleets, on the opening of the season on September 16, left the various ports and were not expected back until the latter part of the month.

Salina Cruz landings were reported to have improved somewhat. Boats were said to be landing around two tons per trip. Prices to vessel owners dropped during August.

During the last half of August, Carmen and Campeche landings improved. At Carmen they averaged around 2,000 pounds a trip and about 1,750 pounds at Campeche. This increase in size of landings reflected a change in species composition. At Carmen during the first half of the month about 50 percent of the shrimp were pink, 30 percent white, and 20 percent brown. This changed during the second half to about 40 percent white, 35 percent pink, and 25 percent brown. At Campeche the landings ran about 90 percent pink, 8 percent brown, and 2 percent white during the first half of August; and about 93 percent pink and 1 percent each white and brown during the second half of the month.

Shrimp sizes at Carmen did not vary much during August. They were about equally divided throughout the month between 30 per pound (headless) and under and 31 count and over. At

Mexico (Contd.):

Item	After September 16, 1960				Prior to September 16, 1960			
	Large Shrimp		Small Shrimp		Large Shrimp		Small Shrimp	
	Pesos Per Metric Ton	US\$ Per Metric Ton	Pesos Per Metric Ton	US\$ Per Metric Ton	Pesos Per Metric Ton	US\$ Per Metric Ton	Pesos Per Metric Ton	US\$ Per Metric Ton
Crew's Share:								
Captain	850	68,05	360	28,82	700	56,04	362,6	29,02
Engineers	650	52,04	310	24,82	500	40,03	312,5	25,02
Winchman	400	32,03	240	19,22	350	28,02	240,0	19,22
Cook	400	32,03	220	17,61	330	26,42	210,0	16,81
Hand	-	-	-	-	330	26,42	210,0	16,81
Total	2,300	185,15	1,130	90,47	2,210	176,93	1,335,0	106,88
Cooperative's Share:								
Severance tax	220	17,61	220	17,61	220	17,61	220,0	17,61
Administration	200	16,01	200	16,01	200	16,01	200,0	16,01
Total	420	33,62	420	33,62	420	33,62	420,0	33,62
Grand Total	2,720	217,77	1,550	124,09	2,630	210,55	1,755,0	140,50

Table 2 - Payments Other Than Shares by Mexican Gulf of Mexico Vessel Owners

Item	September 16, 1960			
	After		Prior	
	Pesos	US\$	Pesos	US\$
Food, per-man-per-day	9	0,72	8	0,64
Social Security, per-boat-per-month	1/500	40,03	1/500	40,03
Wages per-day while vessel under repair:				
Captain	25	2,00	2/	2/
Engineer	20	1,60	2/	2/
Winchman	15	1,20	2/	2/
Cook	15	1,20	2/	2/

1/Cuidad del Carmen boat owners will pay 400 pesos per-boat-per-month until Social Security is inaugurated at this port at which time they will pay 500 pesos.
2/Individual arrangements with boat owners.

Table 3 - Ex-Vessel Shrimp Prices Early September 1960 At East and West Coast Mexican Ports

Size (No. heads-off shrimp per lb.)	Carmen-Campeche (All species)	Salina Cruz (Brown only)
	.....(U. S. Cents Per Lb.),.....	
Under 15	58-61	48
15-20	55-60	48
21-25	49	38
26-30	45	34
31-35	40-42	-
31-40	-	24
36-40	35-36	-
41-50	30-31	20
51-65	25-26	-
51 and over	-	15

Campeche sizes decreased from about 80 percent 30 count and under during the first half to about 60 percent during the second half. (United States Embassy, Mexico City, September 20, 1960.)

1/These payments represent the net share for the crew and not the prices paid the vessel (ex-vessel prices).

* * * * *

WEST COAST SHRIMP FISHERY TRENDS:

The closed season on shrimp fishing in the Guaymas area ended on September 1, 1960, for inshore areas and on September 15 for deep-sea fishing. The landings for the first months following the closed season are usually good, with production falling off just prior to the next closed season. First reports indicate that shrimp production this year will follow the established pattern.

Shortly before the opening of the new shrimp season the fleet owners and the cooperatives reached an understanding and signed an agreement governing their relationships for the next two years.

The shrimp season in the Mazatlan area for deep-sea fishing opened on October 1, 1960. The season in shallow-water shrimp fishing in that area opened early in September with catches in the areas north of Mazatlan reported "good" and the areas to the south "fair." (United States Consulate in Nogales, October 3, 1960.)



Netherlands

BILLS PASSED APPROVING WITHDRAWAL FROM WHALING CONVENTION AND REGULATING ANTARCTIC WHALING:

The Netherlands First Chamber on September 27, 1960, approved bills endorsing the Netherlands' withdrawal from the International Whaling Convention and giving the Government the authority to issue regulations governing whaling by Dutch vessels.

During debate on the first bill, the Minister of Agriculture rejected the suggestion from a Labor Party member that the Netherlands follow Norway's example and rejoin the Convention. He reportedly said that the Dutch position of waiting until its conditions had been met before rejoining was "more realistic" than the Norwegian course of rejoining subject to conditions.

Passage of the 1960 Whaling Act enables the Netherlands Government to ensure that the Netherlands Whaling Company observes such provisions of the Convention and Schedule to the Convention as the Government may desire. (United States Embassy, The Hague, September 29, 1960.)

Note: Also see Commercial Fisheries Review, Oct. 1960, p. 75.



Norway

FISH MEAL PRODUCTION, 1958-60:

In 1958, Norway's total fish-meal production amounted to 118,900 metric tons of which 100,000 tons were herring meal. In 1959 fish-meal production totaled 128,000 tons, of which 110,000 tons were herring meal and 18,000 tons of other fish meal. As of July 1960, the Norwegian herring catch had been poor--total estimated production of herring meal for 1960 is only 70,000 tons. (U. S. Foreign Agricultural Service Report, July 27, 1960, Copenhagen).

FOREIGN TRADE AND PRODUCTION OF MARINE OILS, 1956-1960:

Production: Norway's total production of marine-animal oils was 203,720 metric tons in 1959, or about the same as the 201,981 tons produced in 1958. The estimated production of marine oils in 1960 indicates a drop of about 20 percent to 164,000 tons (table 1).

Table 1 - Norway's Production of Marine Oils, 1956-60

Type	1960 ^{1/}	1959	1958	1957	1956
..... (Metric Tons)					
Cold-cleared cod-liver oil	15,000	15,900	11,900	10,300	12,400
Other fish-liveroils	1,400	1,400	4,600	3,700	4,500
Herring oil	26,000	40,000	34,000	67,424	110,828
Total Fish Oils	42,400	57,300	50,500	81,424	127,728
Seal oil	5,000	4,500	5,500	4,700	5,000
Sperm Oil:					
Antarctic	10,947	15,097	20,751	16,874	22,569
Norwegian shore stations	400	216	672	227	469
Total Sperm Oil	11,347	15,313	21,423	17,101	23,038
Whale Oil:					
Antarctic	104,387	125,480	123,946	153,167	121,898
Norwegian shore stations	800	1,127	612	769	649
Total Whale Oil	105,187	126,607	124,558	153,936	122,547
Grand Total	163,934	203,720	201,981	257,161	278,513

^{1/}Forecast.

The nine Norwegian Antarctic pelagic expeditions and the one Norwegian shore station at Husvik Harbor produced 125,480 tons of whale oil and 15,097 tons of sperm oil during the 1958/59 season, a decline from the previous season. Preliminary results from the 1959/60 season indicate a further reduction of 18 percent in whale oil and sperm oil production since only 104,387 tons of whale oil and 10,947 tons of sperm oil were produced (table 2). The Norwegian production of whale and sperm oil from the 1958/59 Antarctic season was sold, as usual, through the Norwegian whaling companies' common marketing pool.

Table 2 - Norwegian Production of Whale and Sperm Oil, 1959-60

Area and Year	Whale Oil	Sperm Oil	Total
..... (Barrels) ^{1/}			
Pelagic Production, Antarctic:			
1959/60 ^{2/}	588,450	63,438	651,888
1958/59 ^{3/}	712,884	84,502	797,386
1957/58	732,106	122,569	854,675
1956/57	857,326	98,273	955,599
1955/56	657,872	131,517	789,389
Husvik Harbor, South Georgia:			
1959/60 ^{2/}	25,230	920	26,150
1958/59 ^{3/}	24,799	4,252	29,051
1957/58 ^{4/}	-	-	-
1956/57	47,381	1,393	48,774
1955/56	62,141	1,787	63,928
Shore Stations in Norway:			
1959 ^{2/}	6,626	1,271	7,897
1958 ^{3/}	3,598	3,951	7,549
1957	4,525	1,337	5,862
1956	3,834	2,930	6,764
1955	6,158	1,830	7,988

^{1/}One long ton equals 6 barrels.

^{2/}Preliminary.

^{3/}Revised.

^{4/}Not in operation.

Herring oil production in 1959, although not as poor as in 1958, was still far below the average for preceding years. Only about 40,000 tons of herring oil were produced in

Norway (Contd.):

1959. In 1960, however, the catches of herring as well as deliveries to the oil and meal factories were lower than for many years, and the oil production may only reach 26,000 tons. But since the late start of the 1960 herring fishing suggests a lower fat content, the 1960 production may be less than 26,000 tons.

Production of fish-liver oils rose from 16,500 tons in 1958 to 17,300 tons in 1959. On the other hand, seal-oil production (varies between 4,000 and 5,000 tons annually) dropped slightly in 1959 to about 4,500 tons.

Norwegian whale oil from the 1958/59 Antarctic season was sold at prices varying from £72 10s. to £78 (US\$203 to \$218.40) a long ton. The average price was £73 2s. 4d. (\$204.73) a long ton as compared with £72

Exports: During 1958 and 1959 Western Germany and the United Kingdom were the principal receivers of Norwegian Antarctic whale and sperm oil. Total whale and sperm oil exports remained relatively stable during that period (see table 2).

Norway's exports of all marine oils and byproducts continued stable during 1958-59 (see table 3). The bulk of these exports was crude whale oil and edible marine-animal oils.

Imports: Norwegian imports of marine oils increased from 15,713 metric tons, valued at US\$3.4 million, in 1958, to 55,766 tons, valued at US\$10.7 million, in 1959 (see table 4). Increase was due chiefly to larger imports of crude herring oil from Western Germany and menhaden oil from the United States.

Stocks and Utilization: From 1956 to 1959 Norway augmented her lower production of

Table 3 - Norwegian Exports of Marine Oils and Byproducts, 1958-59

Products	Quantity		Value			
	1959	1958	1959	1958	1959	1958
	.. (Metric Tons) ..		.. (Kr. 1,000) ..		.. (US\$1,000) ..	
Whale oil, crude ^{1/}	92,719	95,099	131,421	135,911	18,399	19,000
Whale, sperm and bottlenose oil	13,408	14,353	14,890	19,719	2,085	2,757
Herring oil, crude	625	240	666	307	93	43
Seal oil, crude	3,248	4,144	4,434	5,786	621	809
Fish-liver oils	18,444	17,763	33,503	34,429	4,690	4,813
Refined marine oils, edible	1,026	1,661	1,868	3,330	262	465
Refined marine oils, other	3,259	1,252	3,621	1,946	507	272
Marine-animal oils, polymerized, oxidized, etc., edible	678	592	1,223	1,134	171	159
Hardened fats from marine-animal oils, edible	44,651	39,469	85,111	77,735	11,916	10,867
Hardened fats from marine-animal oils, for technical use	8,329	7,503	14,137	12,657	1,979	1,769
Fatty acids from marine oils and products from sperm and bottlenose oils	8,056	4,221	14,239	10,126	1,994	1,416
Other products	777	2,238	1,531	4,465	214	624
Total	195,220	192,546	306,644	314,219	42,931	43,927

^{1/}Includes deliveries from Antarctic expeditions.

Note: Values computed at rate of: 1959 - one krone equals US\$0.1400; 1958 - one krone equals US\$0.1398.

(£203) a long ton the preceding season. The average price for the 1958/59 season production for sperm oil was £50 1s. 3d. (\$140.17) a long ton as compared with £64 19s. 9d. (\$181.96) a long ton for 1957/58 season production.

marine oils by drawing on stocks (table 5). Almost all marine oils are consumed in the form of hardened fats as raw material for the margarine industry. The use of hardened marine oils by the Norwegian margarine industry increased from 52,681 metric tons

Table 4 - Norwegian Imports of Marine Oils, 1958-59

Type	Quantity		Value			
	1959	1958	1959	1958	1959	1958
	.. (Metric Tons) ..		.. (Kr. 1,000) ..		.. (US\$1,000) ..	
Whale oil, crude	5,432	2,326	8,579	3,798	1,201	531
Sperm and bottlenose, oil, crude	50	589	59	731	8	102
Herring oil, crude	39,478	6,632	49,752	8,352	6,965	1,168
High-potency (vitamin A) oil	961	919	6,425	5,610	900	784
Cod-liver oil	521	-	785	-	109	-
Veterinary fish-liver oil	1/	5	1	3	2/	2/
Industrial fish-liver oil	7,125	4,548	9,698	5,280	1,358	738
Residual fish-liver oil	2,199	694	1,139	538	160	75
Total	55,766	15,713	76,438	24,312	10,701	3,399

1/ Less than one-half ton.

2/ Less than US\$1,000.

Norway (Contd.):

Table 5 - Norwegian Stocks of Marine Oils, 1956-59

Type	Quantity			
	As of December 31			
	1959	1958	1957	1956
	..... (Metric Tons)			
Herring and whale oil, crude	38,459	44,580	71,764	67,981
Other marine oils	198	311	355	439
Total	38,657	44,891	72,119	68,420

in 1958 to 57,091 tons in 1959. (U. S. Foreign Agricultural Service Report, July 27, 1960, Copenhagen.)

* * * * *

CONDITIONAL READHERENCE TO INTERNATIONAL WHALING CONVENTION ANNOUNCED:

On September 23, 1960, the Norwegian Government announced that it intended to readhere to the International Whaling Convention but that it would not be able to continue to adhere to the agreement unless (1) the Netherlands returns to the Convention; (2) the U. S. S. R. catch does not exceed 20 percent of the total whale quota; and (3) the other whaling nations reach agreement on the distribution of the remaining 80 percent of the total quota. (United States Embassy in Oslo, September 30, 1960.)

* * * * *

in their share of the proceeds of whaling operations, and pay for Sunday work. The increase altogether would amount to 7-8 percent. Balloting on the agreement was light, but a clear majority voted in its favor, the United States Embassy in Oslo reported on September 30, 1960.



Peru

EXPORTS OF MARINE PRODUCTS, JANUARY-JUNE 1959 AND 1960:

Exports of principal marine products by Peru during January-June 1960, amounted to 322,156 metric tons (valued at US\$29.9 million)--up almost 109.2 percent in volume and 47.7 percent in value from the 153,975 tons (valued at US\$20.2 million) exported in the first six months of 1959. Exports of 285,503 tons of fish meal (valued at US\$23.9 million) were higher by 131.0 percent in quantity and 64.5 percent in value in the first half of 1960 as compared with the same period of 1959. The average export value of fish meal per metric ton during the first six months of this year was only \$83.70 a metric ton--down sharply from the average price of \$117.52 a ton during January-June 1959. Fish oil exports also increased substantially (up 92.2 percent in quantity and 120.1 percent in value)

Peruvian Exports of Principal Marine Products, January-June 1959 and 1960

Marine Products	2nd. Quarter 1960			January-June 1960			January-June 1959		
	Qty.	Value 1/		Qty.	Value 2/		Qty.	Value 2/	
	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000	Metric Tons	Million Soles	US\$ 1,000
Fish meal	137,412	300.6	10,899	285,503	660.8	23,899	123,580	390.7	14,524
Fish (frozen, canned, etc.)	8,243	50.8	1,842	16,776	106.6	3,855	17,208	116.4	4,327
Fish oil	8,272	24.5	888	13,175	32.2	1,382	6,926	16.9	628
Sperm oil	473	1.6	58	5,281	17.5	633	4,031	13.6	506
Whale meal	-	-	-	308	0.5	18	1,825	5.4	201
Fertilizer (guano)	-	-	-	1,114	2.5	90	405	1.0	37
Total	154,400	377.5	13,687	322,156	826.1	29,877	153,975	544.0	20,223

1/F. o. b. values, converted at rate of 27.58 soles equal US\$1 for 2nd Quarter of 1960.
2/F. o. b. values, converted at rate of 27.65 soles equal US\$1 for first half of 1960 and 26.90 soles equal US\$1 for first half of 1959.

WHALING CREWS RECEIVE WAGE INCREASE:

Crews of Norwegian whaling vessels have voted to accept a wage agreement negotiated on their behalf by the Seamen's Union with employer representatives, with the assistance of voluntary mediators. The crews are to receive a 5 percent increase in wages and

this January-June from the first six months of 1959.

* * * * *

FISHING VESSEL FLEET AS OF JULY 1960:

As of July 1960 some 2,018 Peruvian-flag vessels and 113 United States-flag ves-

Peru (Contd.):

sels were engaged in commercial fishing in Peruvian waters. Excluding rowboats and vessels with sails from the total number of vessels, there were 991 motor-powered Peruvian-flag vessels and 113 United States-flag vessels engaged in commercial fishing.

Vessel Type	Number of Vessels		Type of Equipment Used
	Peruvian Flag	U. S. Flag	
Purse seiners	445	5	Nylon nets, 200-500 fathoms, by 5 fathoms in depth
Bonito vessels (Boniteros)	185	-	Nets of 20-30 fathoms by 5 fathoms in depth
Tuna clippers	-	108	Pole-and-line fishing & fishing for bait
4-ton vessels for various types of fishing	354	-	Hook-and-line & trawls
Whaling vessels	7	-	Harpoons
Rowboats	77	-	Nets & hook-and-line
Sailboats	950	-	Nets & hook-and-line
Total	2,018	113	

This number compares with an estimated 700 motor-driven fishing craft in operation in 1957 and an estimated 800 powered domestic fishing vessels engaged in fishing operations as of December 31, 1958, the United States Embassy in Lima reported on September 23, 1960.



Philippines

CANNED FISH RETAIL AND WHOLESALE PRICES, MAY 3-JULY 1, 1960:

Retail and wholesale prices, May 3-July 1, 1960, for canned sardines and canned salmon in Manila were:

Product	Wholesale US\$/cs	Retail US\$/Can
Canned sardines:	(48 15-oz. Cans)	
U. S. brand	11.25-12.00	27.5-32.5
Japan brand	10.50-10.90	25.0-27.5
Canned salmon:	(48 16-oz. Cans)	
U. S. brand	1/	57.5-80.0
Other imported brands	1/	65.0-85.0

1/No quotations.



Portugal

CANNED FISH EXPORTS, FIRST HALF 1960:

Portugal's exports of canned fish during the first half of 1960 amounted to 25,994 metric tons. Sardines comprised the bulk of these exports with 85.6 percent of the total, followed by anchovy fillets (7.9 percent).

Product	January-June	
	1960	1959
. . . (Metric Tons ^{1/}) . . .		
In Oil or Sauce:		
Sardines	22,244	24,819
Chinchards	412	24
Tuna & tuna-like	997	1,184
Anchovy fillets	2,062	3,296
Mackerel	125	2,032
Others	154	1,295
Total	25,994	32,626

1/Case data not available.
2/Probably included in others.

During this period Portugal's most important canned fish buyers were Germany with 5,752 tons followed by England with 3,450 tons, the United States with 3,064 tons, Italy with 2,276 tons, France with 1,947 tons, and Belgium-Luxembourg with 1,670 tons. (Conservas de Peixe, July and August, 1960.)

CANNED FISH PACK, FIRST HALF 1960:

The Portuguese pack of canned fish, in oil or sauce, for the first half of 1960 amounted to 11,809 metric tons or 669,000 cases. Sardines accounted for the bulk of the pack with 51.8 percent of the total; tuna and tuna-like fish followed with 24.8 percent. (Conservas de Peixe, August 1960.)

Product	January-June			
	1960		1959	
	Metric Tons	1,000 Cases	Metric Tons	1,000 Cases
In Oil or Sauce:				
Sardines	6,114	322	5,200	273
Sardine-like fishes	-	-	468	24
Chinchards	288	15	-	-
Mackerel	119	4	185	7
Tuna and tuna-like	2,934	104	2,691	96
Anchovy fillets	2,119	212	3,257	325
Others	235	12	524	27
Total	11,809	669	12,325	752

FISHERIES TRENDS, SECOND QUARTER 1960:

During the second quarter of 1960, Mata-sinhos was the leading sardine fishing port

Portugal (Contd.):

in Portugal. Sardine landings improved during the early part of the quarter in central and southern Portuguese coastal cities, such as Setubal, Lagos, and Portimao. Some concern was expressed by the canners for the higher sardine ex-vessel prices during May and June, and a possible adverse effect on canned fish exports.

Sardine landings for January-June 1960 amounted to 20,479 metric tons. In addition, there were landings of 1,043 tons of anchovy and 9,763 tons of chinchard. Other species landed, for which data are available only for January-May 1960, were 690 tons of tuna, 89 tons of mackerel, and 32 tons of bonito.

Portuguese canned fish exports declined by 5,695 metric tons when compared with the second quarter of 1959, mostly due to a noticeable drop in sardine exports; likewise, the canned fish pack declined by 622 tons. (Conservas de Peixe, June through August 1960.)



Spain

BALEARIC ISLANDS SHRIMP FISHERY:

Many species of shrimp are caught by Spanish fishermen, mostly by trawling. The white shrimp (Parapenaeus longirostus) constitute the principal source of income for the smaller vessels that fish in the southern part of Spain. This species is little known in the Balearic Islands in the Mediterranean.

The pink shrimp (Aristeus antennatus) and the "chorizo" shrimp (Aristeomorpho foliaceo) are the two principal species that the fishing fleet catches in the Balearic Islands and part of the Levant area. Each species is found in its own area and depth zone.

The shrimp fishing fleet of the port of Palma, in the Balearic Islands, leaves port early (about 1:00 a.m.) daily. The vessels stay out fishing until the early afternoon and usually make two drags.

The shrimp, after being brought aboard, are sorted from the small fish and trash, and packed in boxes with ice.

Since the initiation of shrimp fishing at greater depths in 1948, shrimp landings in the Balearic Islands have increased.

Shrimp Landings in the Balearic Islands (Spain), 1948-58 ¹ / ₁	
Year	Quantity
	Metric Tons
1958	309.4
1957	177.3
1956	154.4
1955	145.9
1954	116.9
1953	121.1
1952	94.9
1951	69.5
1950	53.9
1949	18.9
1948	16.2

¹/Does not include shrimp caught in waters adjacent to the Balearic Islands but landed in other ports.

Shrimp landings in the Balearic Islands are at their peak in late summer, and with exception of the winter months, landings are good.



U. S. S. R.

NEW FREEZER-FACTORYSHIP COMPLETED:

A Leningrad, U. S. S. R., shipyard has delivered a new combination freezer-factoryship, according to the August 17, 1960, issue of Leningradskaja Pravda. The 10,000-ton vessel is named Simferopol and has made its trial trip. The vessel has a freezing capacity of 100 metric tons of fish or whale meat per 24 hours and is intended to transport fish or whale meat. (Fiskets Gang, September 16, 1960.)



United Kingdom

FISH MEAL PRODUCTION AND FOREIGN TRADE, 1955-59:

Production: From 1955 to 1959 the United Kingdom's domestic production of white fish meal remained fairly constant, while imports of white fish meal and herring meal increased considerably (see table 1). In 1959 the United Kingdom produced 78,300 long tons of fish meal, 73,700 tons (94 percent) of which was white fish meal and the balance, 4,600 tons, of herring meal.

The availability of domestically-caught herring for reduction in Great Britain has been decreasing in recent years,

United Kingdom (Contd.):

Table 1 - United Kingdom's Production and Imports of Certain Fish Meals, 1955-59

Year	Domestic Production of White Fish Meal	Imports of White Fish and Herring Meal
	..... (1,000 Long Tons) . . .	
1959	74	147
1958	74	113
1957	75	109
1956	79	108
1955	77	91

and because of this the Herring Industry Board felt it could not commit itself to increased offerings of herring meal for sale during the first nine months of 1959 as compared with 1958. The Herring Industry Board was of the opinion that Peruvian meal, then offered for sale at 20 percent less, would not have any immediate harmful effect on the herring industry, as most buyers were already committed to purchases of domestic meal until March 1960.

Imports: Imports of Peruvian fish meal increased from 11,000 tons in 1958 to over 30,000 tons in 1959--the trend was still upward during the early months of 1960. There was also a substantial rise of imports from Norway and Denmark. Prices of domestic white fish meal in the United Kingdom held firm until the latter part of 1959, but from then on the increased imports began to have a marked effect on prices, to the detriment of the domestic fishing industry. Peruvian fish meal and oil gave the United Kingdom considerable competition in the European market.

* * * * *

CRUDE WHALE AND HERRING OIL UTILIZATION INCREASED:

Utilization of crude whale and herring oil in Great Britain increased from 72,600 long tons during the first half of 1959 to 78,000 tons during the same period of 1960. (U. S. Foreign Agricultural Service Report, London, October 5, 1960.)

* * * * *

EFFECT OF PRESERVATIVES ON FISH MEAL AND OIL QUALITY:

The studies by the British Torry Research Station on the preservation of whole fish and fish waste prior to processing into fish meal and oil were summarized in Food Investigation Technical Paper No. 6. The report has been re-issued and brought up to date by the inclusion of more recent work on the nutritional value of preserved material. The new publication appears as Torry Technical Paper No. 2, Preservation of Fish and Fish Offal for Oil and Meal Manufacture.

It is now clear that, although formaldehyde or nitrite may be used effectively in the stor-

age of whole fish, it would not be advisable to contemplate storage of minced material with these preservatives. Valuable flesh and tissue proteins react with these chemicals, and the lysine in the protein can be shown to be rendered partially unavailable by both chemical and biological methods of testing.

Storage of minced material would be ideal for production of meal and oil by azeotropic processes and this therefore is disappointing. Meals made from whole fish and large pieces of offal treated with preservatives are of high biological value as only the skin and surface proteins react with the chemicals.

The original paper stimulated exchange of information with other countries, and it has been possible to reproduce some of their data in the new report.

It is interesting to note the lengthy periods for which white fish offal can be stored under the climatic conditions in Newfoundland and the beneficial effects of preservation for even a few hours storage as in the United States menhaden industry.

Formaldehyde with chlortetracycline reduced the bacterial count in 48 hours by 250,000 times. The significance of this in connection with odors from reduction factories warrants consideration. (The Fishing News, September 16, 1960.)

* * * * *

NEW FREEZE-DRYING PROCESS INCREASES SHELF LIFE OF FOODS:

A new food-preserving process, which reportedly increases the shelf life of foods to approximately two years, has been commercially developed by a British company and is being viewed with interest by several United States food companies, according to the Food Field Reporter of July 4, 1960. The process, known as Accelerated Freeze-Drying, will be used commercially for the first time anywhere by a British firm for a wide range of vegetables slated for export. Installation is expected by February 1961.

It is reported that this new process provides a logical advance in the prepacked food market and an alternative to deep-freeze methods of food preservation.

Technically, the process employs heating and drying of foods in a vacuum. The food is maintained at temperatures below freezing while it still has water content. In this way, the moisture in the frozen state converts to vapor without passing through the liquid phase. The effect is that all the natural flavor and color of the food is restored when the water is replaced. The process does not collapse the cells of the food. With the addition of water, the food regains its natural fresh appearance.

Besides cutting earlier standard freezing process time by one-third, food processed by Accelerated Freeze-Drying

United Kingdom (Contd.):

weighs less than half the normal weight of food. As a result, transportation costs are drastically cut.

Foods processed by Accelerated Freeze-Drying have been subjected to various tests. Numerous tasting panels have judged the quality of the products to be equal to fresh foods and superior to foods preserved by other methods.

The British army has been conducting trials using freeze-dried foods to determine their applicability for use in the armed forces. Both the decrease in weight of the products and their compactness were cited as especially important factors.

Foods subject to freeze-drying could either be cooked in advance or processed raw. The only thing really required is to cut them sufficiently to enable the process to work on the food surface equally.

Originally, extensive research and development on the new process was carried out by the British Ministry of Agriculture, Fisheries and Food. The new system of dehydration was discovered accidentally about five years ago at the ministry's Aberdeen, Scotland, experimental factory.

An accident during experiments with a new vacuum-drying process actually brought about the discovery of freeze-drying. The food was first frozen and then placed between heated metal plates which turned the ice crystals into vapor without melting them. At this time, someone accidentally left open a valve in the machinery.

A severe vacuum was set up which froze the food solid and caused the dehydration process to be cut to one-sixth the ordinary time. As a result, the drying time was reduced from 48 to 8 hours.

* * * * *

NEW PLANT TO PRODUCE FROZEN-FISH DINNERS:

A new fish-processing factory at Grimsby, England, will soon be producing fish dinners, many of them for countries overseas. The factory has an area of 34,000 square feet, is equipped with the most modern machinery and handling equipment, much of it specially designed.

Its owners are among Britain's largest producers of quick-frozen foods, and export frozen fish, fruits, and vegetables to more than 40 different countries, among them the United States and Canada, Australia, Nigeria, Ghana, Southern Rhodesia, Kenya, Uganda, Nyasaland, Uruguay, British Honduras, the Bahamas, Siam, Ceylon, Fiji, Cyprus, Egypt, and Kuwait.

All conveyors and other equipment have been designed for easy cleaning and all conveyor belts are made of nontoxic materials.

The factory also has a cold-storage capacity of 300 tons, which operates at a temperature of -20° F.

A unique feature of the factory is a screw conveyor used to dispose of the fillet waste which is deposited into the conveyor.

A 20-inch screw conveyor passes under each filleting line below floor level, driving the offal forward into a 24-inch transverse screw conveyor carrying it across the factory floor and transferring it to an inclined screw conveyor. This takes the offal 85 feet to the top of a six-ton hopper from which it is discharged into waiting trailers.

There are 360 feet of conveyors and the type used has several advantages, among them the ability to force the offal towards the disposal point in a regular flow. The conveyors are completely enclosed for safety reasons and, while the offal cannot overflow, the system can easily be cleaned.

The conveyors are cleaned out thoroughly by steam at the end of each day's work. Adequate inspection plates are included on each conveyor to facilitate cleaning, but access to the screws cannot be gained while the conveyors are in motion.

All fish trunks and trays are thoroughly washed before use and another unusual feature of the factory is that the washing machine has been installed in the roof so that production space at floor level is used to maximum advantage.

The washing machine tank holds 1,500 gallons of water heated to a temperature of 200° F.

There are separate compartments for the cleaning of fish trunks and trays which are taken to and from their compartments by overhead conveyors. (The South African Shipping News and Fishing Industry Review, June 1960.)

* * * * *

REVIEW OF RESEARCH ON FISHERY BYPRODUCTS:

The United Kingdom is presently conducting extensive research directly concerned with fishery byproducts. Descriptions of work undertaken in the fields of the preservation of the raw material, the capacity of steam-jacketed fish-meal dryers, and concerning odors, follow:

United Kingdom (Contd.):

Preservation of Raw Material: Re-in-festation by blow-fly larvae of herring otherwise satisfactorily preserved with nitrite-formaldehyde, despite the initial kill, is a serious practical problem in summer. Spraying the surface of the mass of preserved fish with a 0.25 percent aqueous emulsion of pyrethrum has been found to be a promising alternative to the use of undesirably high levels of nitrite-formaldehyde. Further work is necessary to determine the frequency of pyrethrum spraying which may be necessary. It will depend on the duration of residual activity after spraying and on how long the surface of the mass of fish remains unbroken (e.g. by addition or withdrawal of fish).

Experiments with preservatives are being extended to material at present discarded at sea from fishing vessels. This would include viscera and unsalable species of fish. Facilities aboard existing vessels would be limited and two possibilities are envisaged: (a) dumping the material into a tank containing enough preservative solution to cover a full load, or (b) spraying a prescribed amount of a much stronger solution of preservative on to each standard measure (e.g. bucketful) of fish or viscera before tipping it into a tank. Preliminary experiments have shown both methods to be feasible, but the choice and amount of preservative require further consideration and experiment. Nitrite is more toxic than formaldehyde, looks innocuous, and has no odor. The objectionable odor of formaldehyde might afford a desirable safeguard against inadvertent contamination of food or drinking water on the trawler. Used alone, formaldehyde above a certain level causes so much toughening of fish that it does not break down adequately in the cook-and-press stage of the fish-meal plant. The amount of preservative should be varied according to the prevailing temperature. Thus, under British summer conditions, formaldehyde alone at 0.6 percent of the weight of the fish, applied as a spray, would be marginal for a 3-weeks' fishing trip, but would be excessive in winter.

Both formaldehyde and nitrite can react with the free amino group of the lysine component of the fish proteins. Lysine which has so reacted and is thus excluded from the chemically-determined "available" lysine has now been found to be unavailable to

chicks. Hence the chemical test is significant when applied to meals made from preserved fish. These findings further emphasize the desirability of preserving fish whole, or in large pieces, where only the surface layer will react with the preservative.

Fish Meal Pilot Plant: Studies are continuing concerning the factors that influence the capacity of steam-jacketed fish-meal dryers. Previous work showed that a straight-line relationship exists between capacity and the cube of the shaft speed, in the range 6-14 r.p.m. Although this simple relationship is not maintained at higher speeds, an increase of 50 percent in plant capacity can be achieved by increasing the shaft speed from the customary 10 to 30 r.p.m.

Experiments involving the introduction of heated air into the dryer have been postponed following difficulties due to bones choking a rotary air lock fitted to the meal outlet. However, capacity has been shown to increase when increased amounts of ventilating air are drawn through the dryer. The limit to this is just below the air velocity at which meal hold-up occurs. To obtain the fullest use of this ventilating air it is recommended that the exhaust vapor off-take duct should be as near as possible to the raw material inlet. This would necessitate the provision of some form of air seal at the inlet, e.g. a hopper of fish waste.

Odors: Pilot-scale tests at a commercial herring-meal factory with a venturi scrubber have been followed by experiments on a similar scale with a specially-built scrubber. One primary consideration was the necessity of ensuring only a low-pressure drop with a high gas-flow rate. At the same time the scrubber was designed to test combinations of water and chemical treatments, with a variety of packings, i.e. it was a flexible research tool. Although it has provided a mass of useful information, there are still many problems in the economical deodorization of the enormous volumes of gaseous effluent from pneumatic dryers.

Deodorization of a steam-heated or other type of indirect dryer is a potentially simpler problem. Pilot-scale experiments involving a completely closed cycle, with total recirculation of the scrubbed air, must await the fitting of a satisfactory air lock on the meal outlet. Tests with both water and chemical scrubbers are continuing. (Torry Research

United Kingdom (Contd.):

Station, Annual Report 1959, Department of Scientific and Industrial Research.

* * * * *

ULTRAVIOLET LIGHT USED FOR PURIFICATION OF OYSTERS:

Scientific use of ultraviolet light is playing a vital part in extensive plans to restore to Poole Harbour, Dorset, England, part of its lost importance in British fisheries. Two groups are trying to re-establish the harbor as one of the country's leading sources of oysters—a position it enjoyed in past centuries.

One of the keys on which success may possibly rest is an installation using germicidal lamps, a system which has been the subject of experiments by the British Ministry of Agriculture and Fisheries. It is also in use in Cornwall and Wales and is being considered by a firm in Colchester, a town renowned for its oysters.

The group consists of part-time oystermen. To meet Ministry of Health requirements concerning bacteriological levels in oysters, leaders of the group worked out details of an ultraviolet lighting purification system. The result has been the installation of a purification plant, built by the group, of three 30-watt germicidal tubes.

All the oysters gathered by the group of part-time oystermen and also by the second group (formed of local professional fishermen) are now being passed through the plant, the fishermen's group using it under an agreement.

The group of "amateurs" started their oyster project in 1953. In September 1958, they formed themselves into a company, with 42 shareholders, and now have more than 500,000 oysters laid in three beds, each of 30 acres, in the harbor.

Oysters gathered from the beds in the harbor are placed in one of two purification tanks—40 feet x 10 feet, and two feet deep—built by the group members at a small headquarters on the harbor foreshore. Then, over a period of 12 hours, the water in the tanks is circulated under the germicidal tubes.

The three-foot lamps are housed just above the water level in a 60-gallon tank, through which the sea water from the main purification tank is passed at the rate of 50 gallons per minute.

To ensure that the ultraviolet light focuses directly on all the water, this is passed at a water-thin depth, over a weir, which divides the 60-gallon tank into two sections. Then as the sea water is being returned in the main tank, it is passed through an aeration system.

An official of the amateur group says: "Our calculations show that we need leave the oysters in the main tank for only 12 hours. In that time, with the constant purification of the water, they pass out sufficient impurities to bring them well within the limits allowed by the Ministry of Health." (The South African Shipping News and Fishing Industry Review, June 1960.)



IMPORTANCE OF CHILLING FISH

If fish is kept at an indoors summer temperature, say, 75° F., the number of bacteria will increase at a rapid rate, and the meat will be spoiled in a very short time indeed. Fortunately, however, the rate of multiplication of bacteria can be reduced by cooling. While it takes only half an hour for a young bacterium to grow and divide into two at summer temperatures, the process takes several hours at the temperature of melting ice (32° F.). At 77° F., 500 bacteria grow to the enormous number of several hundred millions in two days. At 32° F. (ice temperature) the same initial number of bacteria require 14 days to become several hundred millions. In practice spoilage begins to become obvious in fish like cod and haddock only after the numbers of bacteria have gone up to several million bacteria per sq. in. of skin surface.

For practical purposes the quickest, safest and easiest way to cool fish to about 32° F. and keep them at that temperature is to surround them and mix with them liberal amounts of crushed ice. Simply putting fish without ice into a chill room at 32° F. will cool them down very much more slowly even if the fish are laid out singly. Fish contained in wooden boxes put into a chill room without ice will cool down even more slowly since wood is a good heat insulator. Direct and intimate icing, therefore, because of its superior cooling action ensures that spoilage of the fish during the cooling down period is reduced to a minimum. Once fish has been cooled to 32° F. by icing, it can be kept at that temperature only by ensuring that sufficient ice envelops it to absorb heat coming in from its surroundings.



FEDERAL ACTIONS



Department of Health, Education, and Welfare

FOOD AND DRUG ADMINISTRATION

COLOR ADDITIVES REGULATIONS ISSUED:

The Food and Drug Administration on October 12, 1960, issued the first of new regulations under the Color Additives Amendment to the Federal Food, Drug and Cosmetic Act. They became effective immediately upon publication in the Federal Register of October 12, 1960.

The regulations:

1. List the previously permitted coal tar colors which may continue to be used in foods, drugs and in cosmetics without any restriction on the amounts used until the necessary retesting is accomplished. The law allows 2½ years (from July 11, 1960) for the completion of any tests which may be necessary to establish safe limitations on the amounts of any of these colors which are found not completely "harmless." This may be further extended if scientific work completed in the 2½-year period justifies it.

2. Terminate the listing for any use in foods, drugs or cosmetics of the colors External D & C Yellows Nos. 9 and 10. These colors under other designations (FD&C Yellows Nos. 3 & 4) had previously been delisted for all food, drug and cosmetic uses except external uses in drugs and cosmetics.

3. Terminate the listing for unrestricted use of 13 coal tar colors, largely lipstick colors, previously used without any limitation on the amount used. (Four other colors were automatically dropped from the listing because they had never been certified for use.)

4. Establish temporary tolerances for colors used in lipsticks, mouth washes, dentifrices and/or drugs for 11 of the 13 colors delisted for unrestricted use.

5. List color additives other than coal tar colors which were known to have been in use in foods, drugs and/or cosmetics prior to enactment of the law on July 13, 1960, and which may therefore continue in use for the 2½-year grace period, or unless and until data are available on which to establish a tolerance or to revoke the provisional listing.

There may be other non-coal tar colors not listed which were in use prior to July 11. The Agency urged manufacturers of such colors to bring them to its attention promptly so that they may be added to the provisional list if it appears that they may be safely used.



Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

FROZEN OCEAN PERCH AND PACIFIC OCEAN PERCH FILLETS VOLUNTARY GRADE STANDARDS PROPOSED:

Frozen ocean perch fillets (Atlantic) and Pacific ocean perch fillets voluntary grade standards were proposed by the U. S. Bureau of Commercial Fisheries. The regulations are proposed for adoption in accordance with the authority contained in Title II of the Agricultural Marketing Act of August 14, 1946, as amended. Functions under that Act pertaining to fish, shellfish, and any products thereof were transferred to the Department of the Interior by section 6(a) of the Fish and Wildlife Act of August 8, 1956.

The proposed standards, if recommended to the Secretary of the Interior for adoption and made effective, will be the first issued by the Department prescribing voluntary grade standards for frozen ocean perch fillets and Pacific ocean perch fillets.

Prior to the final adoption of the proposed regulations as published in the October 21, 1960, Federal Register, consideration will be given to written comments, suggestions, or objections relating thereto which are received by the Director, Bureau of Commercial Fisheries.

The proposed standards include product description, grades, recommended weights and dimensions, factors of quality and grade (including ascertaining the grade); definitions, lot certification tolerance, and score sheet.

The frozen ocean perch fillets under the standards are described as clean, whole, wholesome fillets cut away from either side of the Atlantic ocean perch (Sebastes marinus) or the Pacific ocean perch (Sebastes alutus) which are packaged and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product.

* * * * *

NEW ALASKA

REGIONAL DIRECTOR NAMED:

The appointment of Harry L. Rietze as Regional Director for the Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, in Alaska, was announced October 12, 1960, by Assistant Secretary of the Interior Ross Leffler. Rietze replaces John T. Gharrett, who earlier this year was transferred to Gloucester, Mass., as Regional Director of the Bureau's North Atlantic Region. Rietze joined the Bureau in Alaska in 1958. Prior to that time he was employed with the Oregon State Fish Commission and was in charge of Columbia River Investigations. In 1958, Rietze was appointed Assistant Regional Director for the Bureau of Commercial Fisheries' Alaska Region and he served in that capacity since that time.



Supreme Court

GULF STATES REQUEST RECONSIDERATION OF DECISION ON OFFSHORE BOUNDARIES:

The United States Supreme Court on September 26, 1960, was asked to reconsider its decision limiting the offshore boundaries of Louisiana, Mississippi, and Alabama to $3\frac{1}{2}$ miles from their shores into the Gulf of Mex-

ico, in a brief submitted by the Attorneys General of 12 states. The brief referred to the Court's May 31, 1960, decision which also ruled that Texas and Florida were entitled to submerged lands and resources extending for $10\frac{1}{2}$ miles into the Gulf.

The brief said that the Submerged Lands Act of 1953 which the Court interpreted in its May 31 decision was not "justified by the history of the region" or the constitutional history of the Nation.

The 12 Attorneys General represented Arkansas, Colorado, Florida, Georgia, Indiana, New Mexico, Oklahoma, North Carolina, South Carolina, Tennessee, Utah, and Virginia. The brief was submitted in support of one filed earlier by Alabama, Louisiana, and Mississippi.



Eighty-Sixth Congress (Second Session)

Public bills and resolutions which may directly or indirectly affect fisheries and allied industries are reported. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



FISH AND WILDLIFE LEGISLATION (Hearings before the Subcommittee on Fisheries and Wildlife Conservation of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-sixth Congress, Second Session, on H.R. 7386 and S. 2053, bills to provide for the acceptance by the United States of a fish hatchery in the State of South Carolina; H.R. 5959, H.R. 6115, H.R. 6184, H.R. 11298, and S. 1262, bills to direct the Secretary of the Interior to establish a research program in order to determine means of improving the conservation of game fish in dam reservoirs; H.R. 8613 and S. 2481, bills to continue the application of the Merchant Marine Act of 1936, as amended, to certain functions relating to fishing vessels transferred to the Secretary of the Interior, and for other purposes; H.R. 2777 and H.R. 3348 to amend the Fisheries Cooperative Marketing Act; and H.R. 9917 and S. 2867, to give effect to the convention between the United States of America and Cuba for the conservation of shrimp, signed at Habana, August 15, 1958, March 22, 23, June 7 and 30, 1960), 120 pp., printed. Contains text and purpose of each bill mentioned; and statements, letters, and testimony by various Congressmen; government and industry officials; and fish canning associations.

MERCHANT MARINE LEGISLATION (Hearings before the Subcommittee on Merchant Marine of the Committee on Merchant Marine and Fisheries, House of Representatives, Eighty-sixth Congress, Second Session, on S. 2185, a bill to provide appropriate public recognition of the gallant action of the steamship Mer-edith Victory in the December 1950 evacuation of Hungnam, Korea; H.R. 3900, a bill to permit the use of foreign-built hydrofoil vessels in the coastwise trade of the Commonwealth of Puerto Rico; H.R. 9599, a bill to provide transportation on Canadian vessels between ports in southeastern Alaska, and between Hyder, Alaska, and other points in southeastern Alaska, and between Hyder, Alaska, and other points in the United States outside Alaska, either directly or via a

foreign port, or for any part of the transportation; H.R. 7102, a bill to amend the Merchant Marine Act, 1936, for the purpose of providing with respect to the requirements for the operation of subsidy constructed vessels that certain vessels shall be considered as operating in foreign trade; H.R. 10470, to authorize the Maritime Administration to make advances on government-insured ship mortgages; H.R. 11199, to further amend the shipping laws to prohibit operation in the coastwise trade of a rebuilt vessel unless the entire rebuilding is effected within the United States, and for other purposes, February 3, March 1, June 10, 17, 21, and 22, 1960), 194 pp., printed. Contains text and purpose of each bill; and statements, letters, and testimony of various Congressmen, government officials, and union and industry representatives.



A FIBERGLAS RAFT FOR GROWING OYSTERS OFF THE BOTTOM

During studies on the growth of oysters off the bottom, a Fiberglas raft was designed and built to support the weight of 25 bushels of marketable oysters. This raft is a rectangular box with horizontal wings on each long side. The box is $12\frac{1}{2}$ feet long, 16 inches wide, and 8 inches high. The wings are $12\frac{1}{2}$ feet long, 10 inches wide, and $\frac{1}{8}$ inch thick. Each wing has two rows of holes ($\frac{5}{8}$ inch in diameter, 4 inches apart). Nylon and plastic strings with experimental oysters attached are hung from these holes. A hole 1 inch in diameter is drilled at each end for the attachment of a mooring line. Total cost of the raft was \$225.

The raft weighs about 70 pounds and can easily be carried by two men. It is so designed that either the top or the bottom can rest in the water. Annually the raft is turned over and all fouling organisms are scraped off.

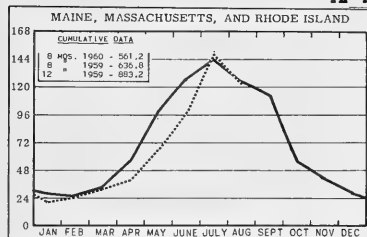
The Fiberglas raft has been moored in 10 feet of water at Taylors Pond, South Chatham, Mass., since August 18, 1958. During this time it has been subjected to strong winds and winter icing without any damaging effects to the structure. To date, use of the craft has proved successful as a method of growing oysters off the bottom. (The Progressive Fish-Culturist, October 1960.)



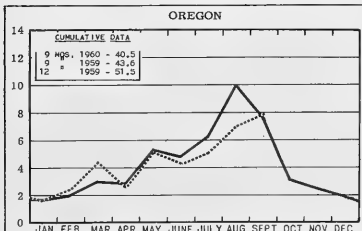
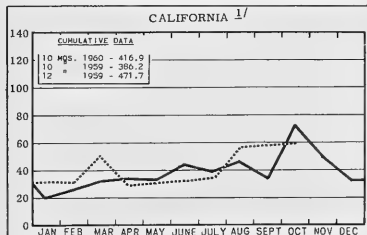
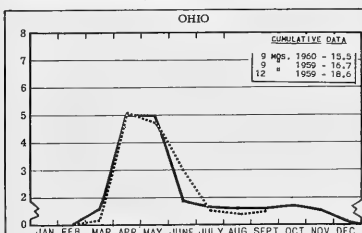
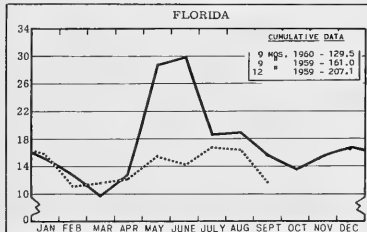
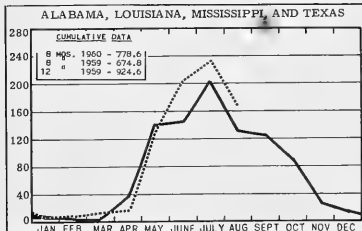
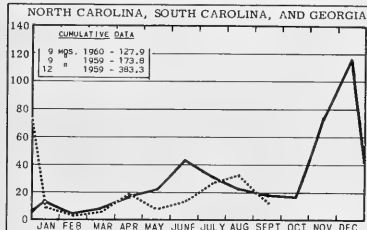
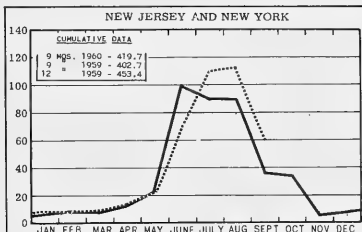
FISHERY INDICATORS

CHART I - FISHERY LANDINGS for SELECTED STATES

In Millions of Pounds



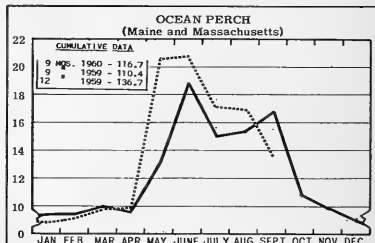
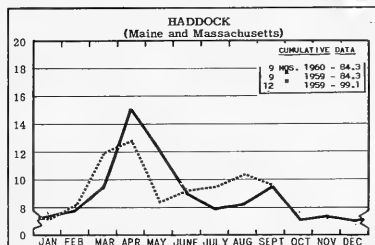
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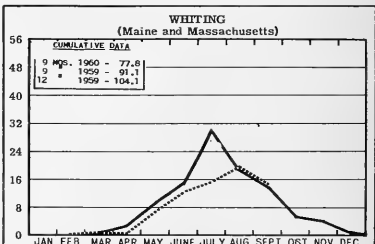
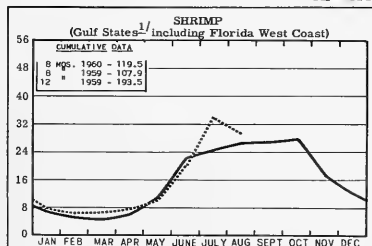
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

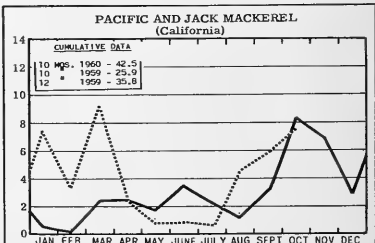
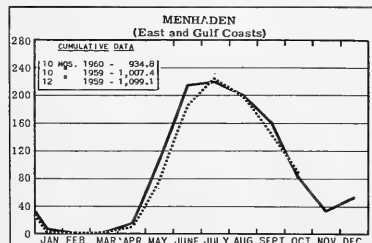


In Millions of Pounds



^{1/2}L.S. & A.L.A. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons



In Thousands of Tons

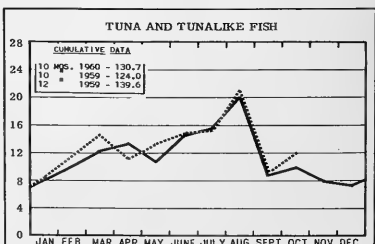
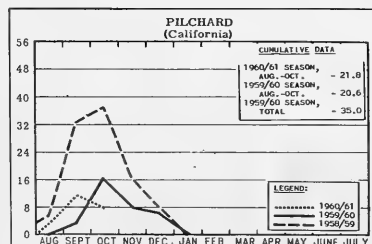
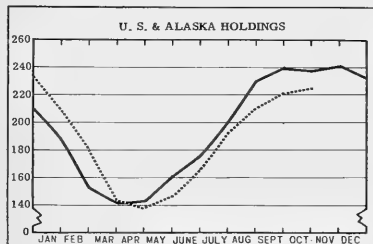
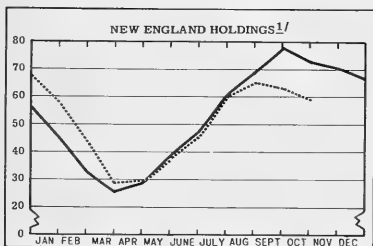
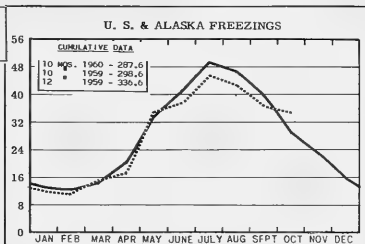


CHART 3 - COLD-STORAGE HOLDINGS and FREEZINGS of FISHERY PRODUCTS *

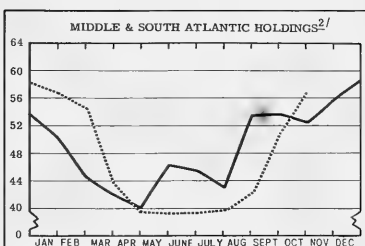
In Millions of Pounds



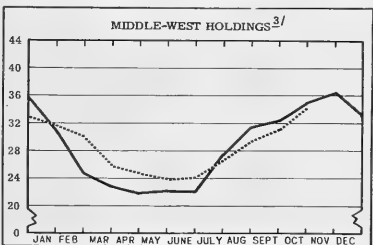
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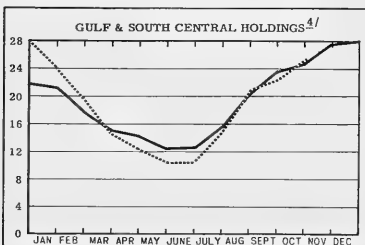
^{1/}MAINE, MASSACHUSETTS, RHODE ISLAND, AND CONNECTICUT



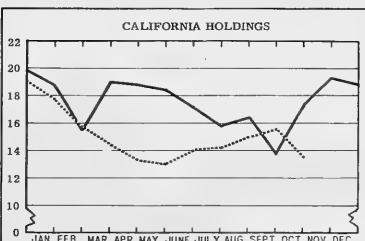
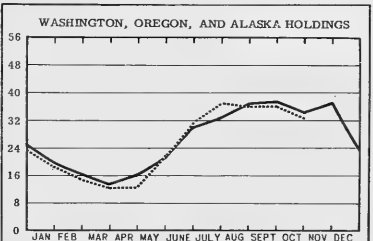
^{2/}ALL EAST COAST STATES FROM N. V. SOUTH.



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

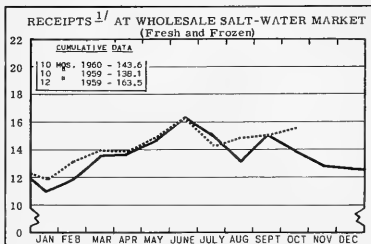


^{4/}ALA., MISS., LA., TEX., ARK., KY., & TENN.

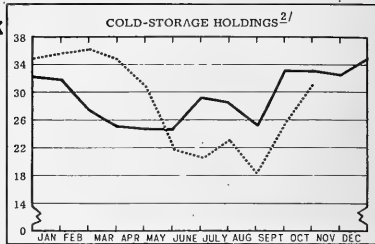


* Excludes salted, cured, and smoked products.

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

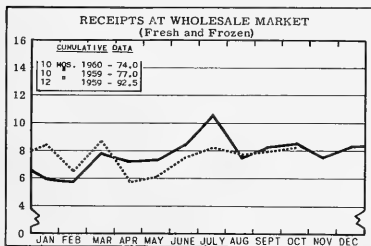


NEW YORK CITY

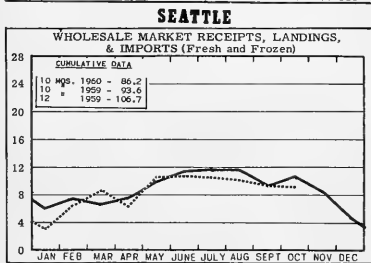
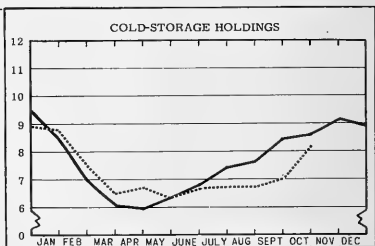


^{1/}INCLUDES TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

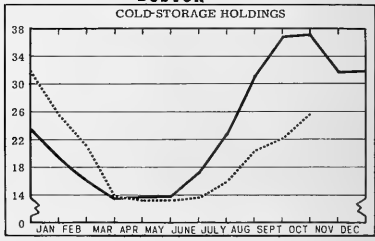
^{2/}AS REPORTED BY PLANTS IN METROPOLITAN AREA.



CHICAGO



BOSTON



LEGEND:
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..... 1959
..... 1958

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

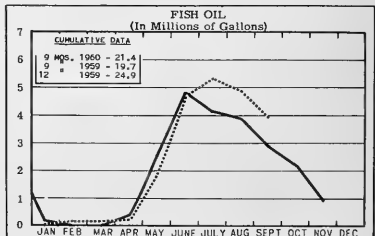
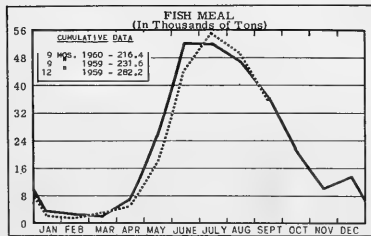
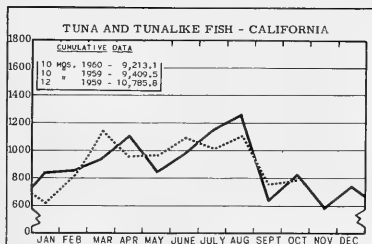
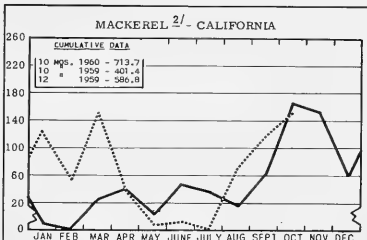


CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

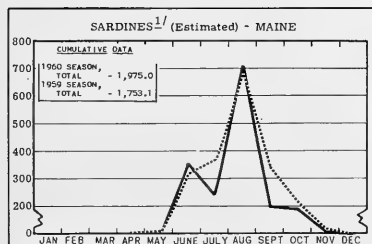
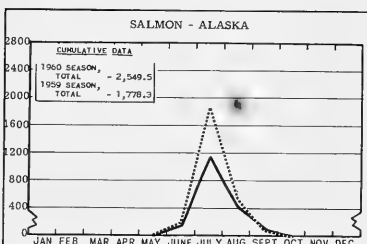
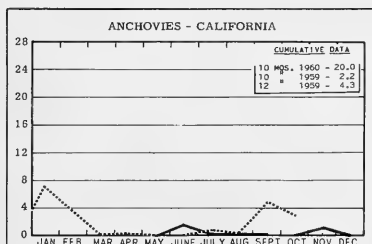
In Thousands of Standard Cases



LEGEND:
 1960
 1959
 - - - - 1958



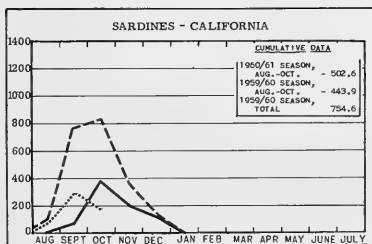
^{2/} INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



^{1/} INCLUDING SEA HERRING.

STANDARD CASES

Variety	No. Cans	Designation	Net Wgt.
SARDINES	100	½ drawn	3½ oz.
SHRIMP	48	--	5 oz.
TUNA	48	# ½ tuna	6 & 7 oz.
PILCHARDS . . .	48	# 1 oval	15 oz.
SALMON	48	1-lb. tall	16 oz.
ANCHOVIES . . .	48	½-lb.	8 oz.



LEGEND:
 1960/61
 1959/60
 - - - - 1958/60

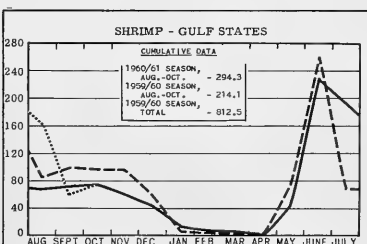
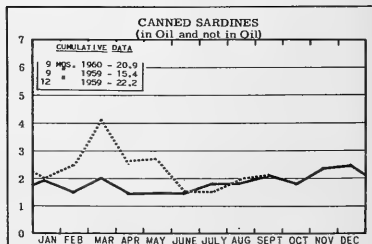
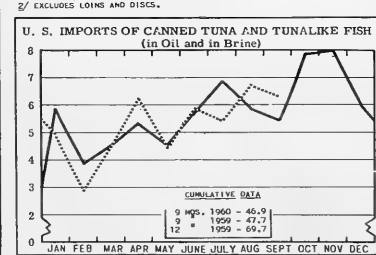
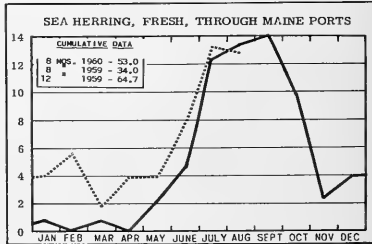
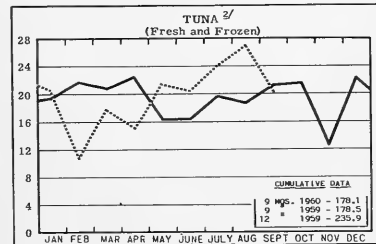
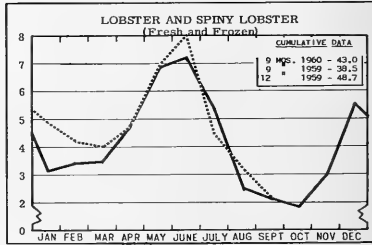
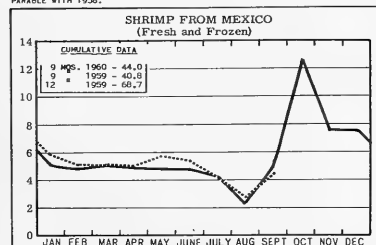
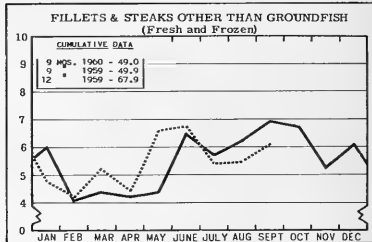
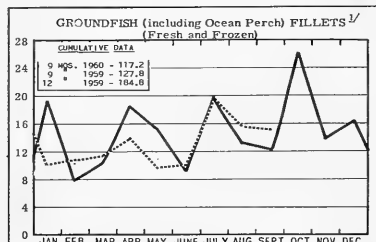


CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

In Millions of Pounds



^{2/} EXCLUDES LOINS AND DISCS.

^{1/} SINCE SEPTEMBER 15, 1959, FISH FILLET BLOCKS ARE CLASSIFIED UNDER A DIFFERENT CATEGORY THAN FILLETS; THEREFORE, 1959 DATA ARE NO LONGER COMPARABLE WITH 1960.



RECENT FISHERY PUBLICATIONS

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.
 FL - FISHERY LEAFLETS.
 SL - BRANCH OF STATISTICS LIST OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
 SSR - FISH - SPECIAL SCIENTIFIC REPORTS-FISHERIES (LIMITED DISTRIBUTION).
 SEP. - SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.

Number	Title
CFS-2388	- Fish Meal and Oil, July 1960, 2 pp.
CFS-2388 (Supplement)	- U. S. Fish Meal and Scrap Production, 1929-1959 (HS No. 2), 4 pp.
CFS-2390	- Frozen Fish Report, August 1960, 3 pp.
CFS-2393	- New York Landings, July 1960, 4 pp.
CFS-2394	- Alabama Landings, May 1960, 2 pp.
CFS-2395	- Alabama Landings, June 1960, 2 pp.
CFS-2396	- Ohio Landings, July 1960, 2 pp.
CFS-2397	- Louisiana Landings, February and March 1960, 3 pp.
CFS-2399	- Shrimp Landings, July 1960, 6 pp.
CFS-2400	- North Carolina Landings, August 1960, 3 pp.
CFS-2401	- Texas Landings, July 1960, 3 pp.
CFS-2402	- Maine Landings, July 1960, 3 pp.
CFS-2403	- Maryland Landings, August 1960, 3 pp.
CFS-2404	- New Jersey Landings, July 1960, 3 pp.
CFS-2405	- Florida Landings, August 1960, 7 pp.
CFS-2407	- Georgia Landings, August 1960, 2 pp.
CFS-2408	- South Carolina Landings, August 1960, 2 pp.
CFS-2409	- Mississippi Landings, June 1960, 2 pp.
CFS-2410	- Texas Landings August 1960, 3 pp.

FL-432 (Revised) - Fishery Statistical Publications of the Bureau of Commercial Fisheries, by E. A. Power and Francis Riley, 31 pp., illus., processed. Contains a descriptive listing of all current fishery statistical publications released by the U. S. Fish and Wildlife Service. Also contains listings of fishery statistical reports released by other Federal agencies, International Commissions, Interstate Compact Commissions, and non-Government fishery agencies. The leaflet catalogs in detail publications in the Current Fishery Statistical series; daily, monthly, and annual Fishery Market News Service reports; Commercial Fisheries Review; and statistical digests. These contain data relating to the volume and value of the catch by area and species; the volume and value of processed products; freezings and cold-storage holdings; foreign-trade data; compilations of landings and distribution and marketing conditions; prices; current data on foreign fisheries; and other pertinent data.

FL-449 (Revised) - Organizations and Officials Concerned with the Commercial Fisheries, 1960, 17 pp., April 1960. Lists officials and organizations concerned with the commercial fisheries in the United States Government, interstate compact commissions, international and related commissions, foreign embassies and consulates with fisheries representation, and industry and related organizations interested in the fisheries. Also lists selected institutions offering courses in fisheries and related sciences, and congressional committees.

FL-492 - Sea Turtles of the United States, by David K. Caldwell, 20 pp., illus., March 1960.

FL-496 - The True Pikes, by John Van Oosten, 9 pp., illus., April 1960.

Wholesale Dealers in Fishery Products, 1959 (Revised):
 SL-8 - Pennsylvania.
 SL-25 - Wisconsin (Great Lakes Area).
 SL-34 - Wisconsin (Mississippi River and Tributaries).

SSR-Fish. No. 322 - Temperatures of Lake Michigan, 1930-32, by John Van Oosten, 36 pp., illus., March 1960.

SSR-Fish. No. 330 - A Photoelectric Current Meter, by H. C. Boyar and F. E. Schueler, 9 pp., illus., March 1960.

SSR-Fish. No. 334 - Limnological Survey of Eastern and Central Lake Erie, 1928-1929, 202 pp., illus., June 1960.

SSR-Fish. No. 345 - Physical, Chemical, and Biological Observations in the Eastern Tropical Pacific Ocean Scot Expedition, April-June 1958, by Robert W. Holmes and Maurice Blackburn, 109 pp., 1960.

Sep. No. 602 - A Review of the Atlantic Coast Whiting Fishery.

Sep. No. 603 - Rapid Objective Freshness Test for Blue-Crab Meat and Observations on Spoilage Characteristics.

Sep. No. 604 - Equipment Note No. 5 - Sink Gill-Net Fishing in New England.

Fishery Bulletin of the Fish and Wildlife Service, vol. 54, 1952 and 1954, Bulletins 75 to 88, 7 pp., printed. Title page, table of contents, and index to be used for binding a set of bulletins issued during 1953 and 1954.

Fishery Bulletin of the Fish and Wildlife Service, vol. 56, 1954-56, Bulletins 90 to 106, 7 pp., printed.

Title page, table of contents, and index to be used for binding a set of bulletins issued during 1954-56.

Fish and the Fishing Industry, by Andrew W. Anderson, 18 pp., illus., printed. (Reprinted from Agricultural Year Book, 1960, pp. 353-370.) This article discusses the chemical and nutritional attributes of fish and shellfish; adoption of standards and voluntary inspection by the fishing industry; statistical data available; Market News Service publications; market development and technological services of the Bureau; species of fish and shellfish available on the market; and an economic analysis of problems of the fishing industry. It also covers the Fish and Wildlife Act of 1956 and the Saltonstall-Kennedy Act; biological research work of the Bureau; work of the Division of Resource Management; and exploratory fishing investigations.

Who Buys Canned Tuna, and Why? Circular 88, 66 pp., illus., June 1960.

Who Buys Canned Salmon, and Why? Circular 89, 52 pp., illus., June 1960.

Who Buys Canned Sardines, and Why? Circular 90, 73 pp., illus., June 1960. This and the other two reports describe the results of surveys of the motivational factors which influence the buying habits of household consumers of canned tuna, canned salmon, and canned sardines. The prime objective of the studies is to aid the domestic canned fish industries to expand markets for their products. Results and findings of the studies are especially directed toward the improvement of promotional and merchandising techniques. However, they have also a direct bearing on other important aspects of canned fish marketing such as the adaptation of the product to meet specific consumer preferences.

THE FOLLOWING MARKET NEWS LEAFLETS ARE AVAILABLE FROM THE BRANCH OF MARKET NEWS, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Number	Title
MNL-33	- Marine Habitat Improvement in Japan.
MNL-34	- Greek Fisheries, 1959.
MNL-35	- Reduction Plants in Newfoundland.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

Alaska Fur Seal Investigations, Pribilof Islands, Alaska (Report of Field Activities, June-September 1959), by Carl E. Abegglen, Alton Y. Roppel, and Ford Wilke, 139 pp., illus., processed, limited distribution. U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Marine Mammal Research, Seattle, Wash.

(Baltimore) Monthly Summary - Fishery Products, May 1960, 8 pp. (Market News Service, U. S. Fish and Wildlife Service, 400 E. Lombard St., Baltimore 2, Md.) Receipts at Baltimore by species and by states and provinces for fresh- and salt-water fish and shellfish; total receipts by species and comparisons with previous years; and wholesale prices on the Baltimore market; for the month indicated.

California Fishery Market News Monthly Summary, Part II - Fishing Information, August and Septem-

ber 1960, 13 and 7 pp., respectively, illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) Topographic chart; sea-surface temperature charts, Eastern Pacific Ocean; and other pertinent data; for the months indicated.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, September 1960, 15 pp. (Market News Service, U. S. Fish and Wildlife Service, 565 W. Washington St., Chicago 6, Ill.) Receipts at Chicago by species and by states and provinces for fresh- and salt-water fish and shellfish; and wholesale prices for fresh and frozen fishery products; for the month indicated.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, September 1960, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 So. King St., Hampton, Va.) Fishery landings and production for the Virginia areas of Hampton Roads, Lower Northern Neck, and Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data; for the month indicated.

New England Fisheries--Monthly Summary, August 1960, 22 pp. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) Reviews the principal New England fishery ports, and presents food fish landings by ports and species; industrial fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and landings and ex-vessel prices for fares landed at the Boston Fish Pier and sold through the New England Fish Exchange; for the month indicated.

New York City's Wholesale Fishery Trade--Monthly Summary for August 1960; September 1960; 18 and 19 pp., respectively. (Market News Service, 155 John St., New York 38, N. Y.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, imports entered at New York City, primary wholesaler prices for frozen products, and marketing trends; for the months indicated.

Pelagic Fur Seal Investigations, California, Oregon, and Washington, 1959, by Karl Niggold, Clifford H. Fiscus, Jr., and Ford Wilke, 100 pp., illus., processed, limited distribution. (U. S. Fish and Wildlife Service, Bureau of Commercial Fisheries, Marine Mammal Research, Seattle, Wash.)

(Seattle) Washington, Oregon, and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, September 1960. 10 pp. (Market News Service, U. S. Fish and Wildlife Service, Pier 42 South, Seattle 4, Wash.) Includes landings and local receipts, with ex-vessel and wholesale prices in some instances, as reported by Seattle and Astoria (Ore.) wholesale dealers; receipts and vessel prices of troll salmon; also

Northwest Pacific halibut landings; and Washington shrimp landings; for the month indicated.

THE FOLLOWING ENGLISH TRANSLATIONS OF FOREIGN LANGUAGE ARTICLES ARE AVAILABLE ONLY FROM THE OFFICE INDICATED:

U. S. FISH AND WILDLIFE SERVICE, BUREAU OF COMMERCIAL FISHERIES, P. O. BOX 3830, HONOLULU, HAWAII.

On the Difference of the Stomach Contents of Tuna and Black Marlin in the South Equatorial Pacific Ocean, by Sigeyuki Koga, 11 pp., processed. (Translated from Bulletin of the Faculty of Fisheries, Nagasaki University, no. 7, 1958, pp. 31-40.)

On the Stomach Contents of Tuna in the West Indian Ocean, by Sigeyuki Koga, 11 pp., processed. (Translated from Bulletin of the Faculty of Fisheries, Nagasaki University, no. 6, 1958, pp. 85-92.)

BIOLOGICAL LABORATORY, U. S. BUREAU OF COMMERCIAL FISHERIES, SEATTLE, WASHINGTON.

Soviet Russian Discontent and the Japanese Fishery Today, by Yoshinosuke Yamazaki, 1 p., processed. (Translated from Suisan Keizai Shimbum, no 2419, March 19, 1959.)

Third Japan-Soviet Fishery Conference - Protect the Salmon Resources from Predation - The Catch Phrase of the Japanese Representatives, 16 pp., processed, March 1959. (Translated from The Fishing Industry Weekly, no. 232, January 15, 1959.)

BUREAU OF COMMERCIAL FISHERIES, TECHNOLOGICAL LABORATORY, SEATTLE, WASHINGTON.

Carbonyl Compounds in Fish as Related to Deterioration. I--Detection of Volatile Carbonyl Compounds Formed in Fish Flesh, by F. Ota, 9 pp., illus., processed. (Translated from Bulletin of the Japanese Society of Scientific Fisheries, vol. 24, no. 5, 1958, pp. 334-337.)

Lipids of the Muscle of Tuna, THUNNUS ORIENTALIS. I--Acetone-Soluble Lipids of the Ordinary Muscle; II--Acetone-Soluble Lipids of the Dark-Colored Muscle, by Hisanao Igarashi, 8 pp., processed. (Translated from Bulletin of the Japanese Society of Scientific Fisheries, vol. 22, no. 12, 1957, pp. 787-794.)

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

Japanese Summer Fishery for Albacore (GERMOAL-ALUNGA), by Wilvan G. Van Campen, Research Report 52, 31 pp., illus., printed, 1960, 15 cents. The important albacore fishery carried on by a fleet of Japanese live-bait tuna boats in the spring and early summer in the northwestern Pacific is described. An account is given of the historical background of the fishery, and the magnitude of its production is compared with other Japanese albacore fisheries and with the United States west coast tuna fishery. The seasonal trends in landings, geographical distribution of bases and fishing grounds, and the marketing and utilization of the catch are discussed. The fishery is shown to be the largest in the world for this species, although a recent outgrowth of, and still subsidiary to, the Japanese skipjack fishery, and to be largely dependent on foreign markets for its support.

"A Portable Conductivity Meter for Use with Electro-fishing Gear," by Richard B. Thompson and Richard H. Van Haagen, article, Progressive Fish-Culturist, vol. 22, April 1960, p. 63, processed, single copy 25 cents.

Relation Between Fish Condition and Population Size in the Sardine (SARDINOPS CAERULEA), by John S. MacGregor, Fishery Bulletin 166 (from Fishery Bulletin of the Fish and Wildlife Service vol. 60), pp. 215-230, illus., printed, 20 cents, 1959.

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 OF THE FISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

AGAR AGAR:

"Studies on the Chemical Constitution of Agar-Agar. XXI--Re-Investigation of Methylated Agarose of Gelidium amansii," by Choji Araki and Susumu Hirase, article, Bulletin of the Chemical Society of Japan, vol. 33, March 1960, pp. 291-295, printed. Chemical Society of Japan, No. 5, 1-Chome, Surugadai Kanda Chiyoda-ku, Tokyo, Japan.

ALGAE:

"New Delhi Symposium on Algae," by G. E. Fogg, article, Nature, vol. 185, March 19, 1960, pp. 820-821, printed. Nature, MacMillan & Co., Ltd., St. Martin's St., London WC 2, England.

ANTIBIOTICS:

"The Application of Chlorotetracycline in Extending the Storage Life of Chilled Fish Fillets," by F. Babin and T. Sakharova, article, Kholodil'naia Tekhnika, no. 4, 1960, pp. 35-37, illus., printed in Russian with short summary in English. Kholodil'naia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N. Y.

"Effectiveness of Tetracycline Treatment on Quality Improvement of Processed Foods. II--Quality Improvement and Chlorotetracycline Residue of Salt Salmon Due to CTC-Treatment," by Tetuo Tomiyama and Yasuo Yone, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, no. 1, 1959, pp. 67-71, illus., printed in Japanese with English abstract. Bulletin of the Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

"Penetration of Tetracycline Antibiotics into Tuna, Sole, and Rockfish Flesh and Their Stability during Steaming and Retorting," by Peter A. Lerke and Lionel Farber, article, Food Technology, vol. 14, May 1960, pp. 217-221, printed. Food Technology, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

AUSTRALIA:

Third Annual Report on the Operation of the Fishing Industry Act 1956 During the Year Ended 30th June 1959, 5 pp., processed. Department of Primary

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

Industry, Canberra, Australia. This report outlines the operations of the Fisheries Development Trust Account, established for the purpose of financing activities designed to foster the development of the Australian fishing industry, for the year ended June 30, 1959. It discusses the shrimp trawling survey; exploratory trawling in the Great Australian Bight; and investigations of the barracuda and spiny lobster industries.

BIOCHEMISTRY:

"The Amino Acid Composition of Some Fish Collagens: The Relation Between Composition and Structure," by Karl A. Piez and Jerome Gross article, Journal of Biological Chemistry, no. 235, April 1960, pp. 995-998, printed. The American Society of Biological Chemists, Inc., Mt. Royal and Guilford Aves., Baltimore, Md.

"Determination of Actomyosin in Fish Muscles," by L. I. Pershina, article, Izvestia Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya, no. 5, 1958, pp. 157-161, printed in Russian. Izdanie Krasnodarskogo Instituta Pishchevoi Promyshlennosti, ul. Krasnaya, 135, Krasnodar, U. S. S. R.

BIOLOGY:

The Biology of Marine Animals, by J. A. Colin Nicol, 718 pp., printed, 95s. (about US\$13.30). Sir Isaac Pitman and Sons, Ltd., London, England, 1960.

BRAZIL:

Lista dos SCIAENIDAE Marinhas Brasileiros, Contendo Chave de Identificacao e Proposta de "Nomes Vulgares Oficiais" (List of the Brazilian Marine Sciaenidae, Containing a Key for Identification and a List of Proposed "Official Common Names"), by Haroldo Travassos and Melquiades Pinto Paiva, 31 pp., illus., printed in Portuguese. (Reprinted from Boletim do Instituto Oceanografico, vol. 8, nos. 1 and 2, 1957, pp. 139-165.) Boletim do Instituto Oceanografico, Universidade de Sao Paulo, Sao Paulo, Brazil.

CALIFORNIA:

California Cooperative Oceanic Fisheries Investigations Reports (January 1, 1958, to June 30, 1959), vol. 7, 217 pp., illus., printed. California Dept. of Fish and Game, Marine Research Committee, Sacramento, Calif., January 1960. This report consists of two sections. The first section contains a review of the present operational organization of the investigations, a brief review of the research under way during the period reported on, a description of the partial resurgence of the sardine fishery during the 1958/59 season, and a list of publications arising from the program. The second section is a report on a symposium held in June 1958 to review the unusual changes in the ocean circulation off California during 1957 and 1958. The cooperating agencies are: California Academy of Sciences; California Department of Fish and Game; Stanford University, Hopkins Marine Station; U. S. Bureau of Commercial Fisheries; University of California, Scripps Institution of Oceanography.

CANADA:

Fisheries Statistics of Canada, 1958 (Ontario, Prairie Provinces, and Northwest Territories), 67 pp., printed in French and English, C\$1. Queen's Printer and Controller of Stationery, Ottawa, Canada, September 1960. Contains tables giving the value of the princi-

pal species of inland fish landed, 1951-58; quantity and value of landings by species and fisheries districts, 1957-58; capital equipment used in the primary fisheries operations; and the number of persons engaged in the fisheries. This information is presented separately for the provinces of Ontario, Manitoba, Saskatchewan, Alberta, and the Northwest Territories.

Fisheries Statistics of Canada, 1958 (Prince Edward Island), 20 pp., printed, 50 Canadian cents. Queen's Printer and Controller of Stationery, Ottawa, Canada, September 1960. Contains tables showing the quantity and value of fishery products landed in Prince Edward Island, 1939-1958, by species; quantity and value by species and fisheries districts; quantity and value of manufactured fishery products by species, 1957-1958; capital equipment in the primary fisheries operations; and the number of fishermen engaged in the primary fisheries operations.

Fisheries Statistics of Canada, 1958 (Quebec), 61 pp., illus., printed in French and English, C\$1. Queen's Printer and Controller of Stationery, Ottawa, Canada, September 1960. Consists of statistical tables giving the quantity and value of the principal species of fish and shellfish landed in Quebec in 1939-58; quantity and value of landings by species and fisheries districts, 1957-58; capital equipment employed in the primary operations by fisheries districts, 1957-58; and number of persons engaged in primary operations by fisheries districts, 1957-58.

Journal of the Fisheries Research Board of Canada, vol. 17, no. 4, July 1960, 149 pp., illus., printed. Queen's Printer and Controller of Stationery, Ottawa, Canada. Contains, among others these articles: "The Effect of Impoundment on the Population and Movement of Atlantic Salmon in Ellerslie Brook, Prince Edward Island," by J. W. Saunders; Assessment of the Progressive Spoilage of Ice-Stored Shrimp," by J. R. Iyengar and others; "Facilities for Anadromous Fish Passage, Passamaquoddy Project," by M. C. Bell and C. H. Clay; "Possible Effects of Passamaquoddy Tidal Power Structures on the Canadian Lobster Industry," by D. G. Wilder; and "The Role of Electrical Conductivity of Water in Shocking Lampreys (Petromyzon marinus)," by R. W. McCauley.

Report of the Royal Commission on Price Spreads of Food Products, vol. III, 570 pp., illus., processed, C\$2. Queen's Printer and Controller of Stationery, Ottawa, Canada, March 1960. Consists of research documents, statistical data, and extended studies of the marketing of particular commodities, including fishery products. The section on fisheries prices includes an introduction to studies of fisheries commodities, and information on canned sockeye salmon; Pacific halibut; lobsters; cod and haddock fillets; and whitefish fillets and dressed whitefish. Contains a number of statistical tables showing the Fisheries Prices Support Board operations, 1948/49 to 1957/58; British Columbia canned salmon pack by species and by years, 1949 to 1958; freight rates on canned fish and boxed fish from British Columbia to eastern Canadian destinations; landings of Pacific halibut, 1949-58; annual Canadian landings and landed values of lobsters, by Provinces, 1949 to 1958; and other pertinent data.

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

CARIBBEAN COMMISSION:

Report of the Third Caribbean Fisheries Seminar (St. Maarten, Netherland Antilles, July 3-9, 1959), 45 pp., processed. Central Secretariat, Caribbean Commission, Kent House, Trinidad, W. I., 1959. Covers the agenda and reports presented at the Third Caribbean Fisheries Seminar attended by delegates and observers from Governments in the Caribbean area. Specific problems related to the fishery industry included fisheries statistics, marketing and economics of the fishery industry, fishing boat design including engine selection, improvement of fishing gear, fish farming, and regional training. The Seminar considered a proposal for the setting up of some regional association of fisheries officers for the Caribbean.

COD:

"Animal Physiology Water Content of Cod (*Gadus callarias* L.) Muscle," by R. M. Love, article, Nature, vol. 185, March 5, 1960, p. 692, printed. Nature, Mac Millan & Co., Ltd., St. Martin's St., London WC 2, England.

"Free and Combined Amino Acids in the Flesh and Liver of Baltic Cod," by Teofil Dabrowski and Zenon Ganowiak, article, Roczniki Panstwowego Zakladu Higieny, vol. 9, 1958, pp. 549-556, printed in Polish with English summary. Panstwowy Zaklad Wydawnictw Lekarskich, ul. Chocimska, 22, Warsaw, Poland.

"The Identity of the Larval Nematodes Found in the Body Muscles of the Cod (*Gadus callarias* L.)," by J. N. R. Grainger, article, Parasitology, vol. 49, May 1959, pp. 121-131, printed. Parasitology, Cambridge University Press, 32 E. 57th St., New York 22, N. Y.

COMMISSIONS:

Twelfth Annual Report of the Pacific Marine Fisheries Commission for the Year 1959, 40 pp., printed. Pacific Marine Fisheries Commission, 741 State Office Bldg., 1400 S. W. Fifth Ave., Portland 1, Oreg. Reports briefly the specific activities of the Pacific Marine Fisheries Commission during 1959 and presents a review of long-term developments in the fields of research, regulation, and coordination. Recommends the admission to membership on the Commission of the States of Alaska and Hawaii and any other state having streams tributary to waters draining into the Pacific Ocean. Presents sections on commercial and sport salmon fisheries, the otter-trawl fishery, the Pacific Coast crab industry, and the shrimp and albacore fisheries.

CORAL REEFS:

"Our First Undersea Park," by Gilbert L. Voss, article, National Parks Magazine, vol. 34, no. 157, October 1960, pp. 12-14, illus., printed. National Parks Association, 1300 New Hampshire Ave., NW., Washington 6, D. C. The Key Largo Coral Reef Preserve, laying entirely under water, was established by presidential proclamation on March 15, 1960. This preservation, about 75 square miles in area, is situated south of Miami and east of the northern Florida Keys. It encompasses both lagoon and barrier reefs and contains two lighthouses. The reefs give shelter to scores of species of fish, including sponges, turtles, grouper, snapper, spiny lobster, and conch. The idea of establishing the park origi-

nated with conservationists interested in preservation of the area from commercial and other depletions, and was realized with the aid of the State of Florida and the U. S. Department of the Interior.

CUBA:

Ichtiologia Cubana (Cuban Ichthyology), by Don Felipe Poey y Aloy, vol. 1, 373 pp., illus., printed in Spanish. Ministerio de Educacion, Republica de Cuba, Havana, Cuba, 1955.

EUROPEAN COMMON MARKET:

"Common Market Speeds Ahead," article, Foreign Commerce Weekly, vol. 64, no. 11, September 12, 1960, pp. 5-6, printed, single copy 15 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

EUROPEAN FREE TRADE ASSOCIATION:

"Completely Free Trade for Members EFTA's Goal by 1970," article, Foreign Commerce Weekly, vol. 64, no. 11, September 12, 1960, pp. 9, 24, printed, single copy 15 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

FAROESE ISLANDS:

Development of the Faroese Fishing Fleet, Faroes in Figures no. 11, September 1960, 6 pp., printed. Faroes in Figures, Faero Amts Sparekasse, Copenhagen, Denmark. Summarizes the renewal and enlargement of the Faroese fishing fleet to date and the purchase and intended purchase of new vessels. Discusses Government and private financing for the building of new vessels and the rebuilding of old ones and the present composition of the fleet. Includes several statistical tables showing types of vessels utilized, operation of the Faroese Fishing Vessel Mortgage Finance Corporation, and production and export of salted fish and dried cod.

FISH CULTURE:

Fish Culture, for Fun, for Profit, by Wayne Seaman and Gene Cook, Educational Pamphlet No. 6, 16 pp., illus., printed. Education Division, Colorado Game and Fish Department, 1530 Sherman St., Denver 1, Colo., revised April 1960. A handbook for those interested in fish culture for sport, food, or economic gain in the Rocky Mountain area. Discusses the basic requirements for fish culture--proper water supplies and suitable construction; trout culture; and warm water fish--water and food, pond and fish, and pond management. A list of reference books on fish culture is included.

Methods of Treating the Bottoms of Fish Ponds and Their Effects on Productivity--Part I; and Fish Culture in Certain European Countries--Part II, by Alfred G. Wurtz, General Fisheries Council for the Mediterranean Studies and Reviews No. 11, 50 pp., processed. GFCM Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, June 1960. Part I, which contains a brief summary of the various methods of treating the bottoms of fish ponds and their effects on productivity, discusses the treatment of the ground at the bottom of

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the ponds, with or without crop growing. The author states that "the drying out of the bottom of fish ponds is indispensable in order to obtain high fish production." Part II gives an account of fish-pond cultural practices and piscicultural research in certain European countries.

FISH FLOUR:

"Biological Quality of Dilis Fish Flour Used as Source of Protein for Growing Rats," by Angelina Alcaraz-Bayan and Ruth M. Leverton, article, Philippine Journal of Science, no. 86, 1957, pp. 259-271, printed. Institute of Science, Manila, Philippines.

FISH MEAL:

"Acceptability of Fish Meal to Young Turkey Poults," by B. A. Krautman and C. D. Caskey, article, Feed-stuffs, vol. 32, March 26, 1960, pp. 74-75, printed. Feedstuffs, Miller Publishing Co., 118 So. 6th St., Minneapolis 2, Minn.

"Quality of Protein in Different Kinds of Fish Powder (Meal)," by A. Vinokurova, article, Sbornik Studii Nauchno-Issledovatel'skii Rabot Moskova Sel'skokhoz. Akademii im. Timiryazeva, no. 8, 1958, pp. 331-336, printed in Russian. Nauchno-Issledovatel'skii Rabot Moskova Sel'skokhoz. Akademii im. Timiryazeva, Moscow, U. S. S. R.

"Relation of Residual Oil and Menhaden Fish Meal Quality," by Thomas L. Meade and Russell T. McIntyre, article, Proceedings of the Gulf and Caribbean Fisheries Institute, vol. 10, 1958, pp. 86-91, printed. The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

FISH OIL:

"Preparation of a Coating Material by Chlorination of Fish Oil. V--Aeration Velocity of Chlorine," by Kosaku Suzuki, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 25, July 1959, pp. 218-221, illus., printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

FLORIDA:

Ichthyological Surveys of the Lower St. Lucie and Indian Rivers, Florida East Coast, by Victor G. Springer, 19 pp., processed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., June 23, 1960.

Summary of Florida Commercial Marine Landings, 1959 and an Analysis of the Catch and Effort of Certain Species, by Albert Rosen, no. 60-2, 54 pp., illus., processed. Florida State Board of Conservation, W. V. Knott Bldg., Tallahassee, Fla., June 1960. Presents a summary of Florida's commercial landings of marine products for 1959. The fisheries for shrimp, mullet, Spanish mackerel, menhaden, and other species are covered. For the second consecutive year, data for individual fishing trips were collected from a sample of fish dealers. Includes a number of statistical tables giving data on landings and value of catches by species and by counties during 1959.

FOOD AND AGRICULTURE ORGANIZATION:

Current Bibliography for Aquatic Sciences and Fisheries, vol. 3, Parts 1 and 2, 192 pp. and 120 pp., respectively, printed, each part 17s. 6d. (US\$2.60),

plus postage, or subscription per volume of 12 parts L9 (US\$27) post free. Fisheries Biology Branch, Food and Agriculture Organization of the United Nations, Rome, Italy, 1960. (Available from Subscription Dept., Taylor & Francis, Ltd., Red Lion Court, Fleet St., London EC4, England.) Lists documents (including films and filmstrips) referring to studies of living aquatic resources and their environments, or to methods of research applicable in that field. References on fishing craft, gear and methods, and on primary fishery industries generally are included where their contents seem relevant to appraisal and use of resources. In addition, references to fisheries legislation concerning secondary and tertiary, as well as primary fishery industries, and relating to economic and technological as well as biological fields, are included.

The Economic Importance of the Sea Fisheries in Different Countries, FAO Fisheries Papers No. 15, 14 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, August 1959. The text of a paper presented at the United Nations Conference on the Law of the Sea, held in Geneva, Switzerland, from February to April 1958. The most general statistical indicator of the importance of sea fisheries in the economy of a country is the proportion of the national income derived from them. This report includes statistical tables showing the product of the sea fisheries as percentage of aggregate domestic product and other indicators of the economic importance of the sea fisheries in selected countries; indicators of the economic importance of the sea fisheries in different countries; and disposition of the catch by countries, 1955.

Mediterranean Brackish Water Lagoons and Their Exploitation, by Ruggero de Angelis, GFCM Studies and Reviews No. 12, 66 pp., illus., processed. General Fisheries Council for the Mediterranean Secretariat, Food and Agriculture Organization of the United Nations, Rome, Italy, August 1960. This is the third and final study in a series on brackish-water fisheries. In the first section of this study, the author discusses the principles of exploitation: history and operation of the "valli," a barricade for trapping lagoonward migrating pelagic fish; characteristics of the lagoons; and gear used in landing the fish found in lagoons. In the second section, he covers the Mediterranean lagoons. Physical characteristics of the various lakes and lagoons are discussed together with the gear used and species of fish found in each locality.

The Need for Economic Statistics of the Fisheries, by Anthony Scott, FAO Fisheries Papers No. 16, 12 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, March 1960. The text of a paper presented at the Expert Meeting on Fishery Statistics in the North Atlantic Area, held in Edinburgh, Scotland, in September 1959. Discusses the need for measuring the costs of fishing, examples of cost statistics, relation between output and cost, the use of cost and value estimates, and fishing in relation to connected industries.

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

Purpose and Methods in Fisheries Statistics, Doc. No. 13--"Development of Fishery Statistics in the Management of Philippine Fisheries," by Bayani Ong-changco, 13 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, March 1952.

_____, Doc. No. 16--"The Statistical Work of the International Council for the Exploration of the Sea in Retrospect," by Nils Rosen, 6 pp., April 1952.

_____, Doc. No. 23--"The Collection of Pelagic Fish Statistics," by B. B. Parrish, 4 pp., May 1952.

_____, Doc. No. 29--"Swedish Fisheries Statistics - Existing Organization and Planned Improvements," by Otto Zetterberg, 5 pp., July 1952.

Some Economic Aspects of Fish Pond Operations, by Wylie D. Goodsell, FAO Fisheries Papers No. 14, 49 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, February 1959. A brief report of a tour of inland fisheries in ten important European, Mid-Eastern and Far-Eastern countries. The object of the tour was to study the economic aspects of fish-pond culture, especially the practices and methods of production, financing, and distribution, and their bearing on costs of operation and income of owners. The tour was connected with and a part of the Third International Inland Fisheries Training Centre held at Bogor, Indonesia, from October 31 to December 10, 1955. The report is divided into sections on pond culture and on general observations on the pond fisheries in the countries visited.

TILAPIA MOSSAMBICA (Peters), Preliminary Findings in Netherlands New Guinea, by G. A. Reeskamp Jr., IPFC Occasional Paper 607/1, 3 pp., processed. Food and Agriculture Organization of the United Nations, Regional Office for Asia and the Far East, Maliwan Mansion, Phra Atit Road, Bangkok, Thailand.

The Use of Fishery Statistics by Government and Business in North America, by John B. Rutherford, FAO Fisheries Papers No. 18, 14 pp., processed, limited distribution. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, July 1960. The text of a paper presented at the Expert Meeting on Fishery Statistics in the North Atlantic Area, which was held in Edinburgh, Scotland, in September 1959. Discusses the position of business and role of governments; classification of uses of fishery statistics; the "action," "immediate," or "short-term" use in marketing by both business and government, in current fisheries management, and in current economic indicators; and the "planning," "research," or "long-term" use in research by business, in biological and economic research by governments and universities, in analyzing and describing industry structure, in general economic investigations, and by governments and international fisheries management.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Technical Assistance Program for developing the fisheries of many countries. These re-

ports have not been published on a sales basis, but have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Report to the Government of:

Iraq on the Development of Inland Fisheries, by A. van den Eelaart, FAO Report No. 270, April 1954.

Chile on Increasing Fish Consumption, by John Fridthjof, FAO Report No. 271, April 1954.

Ceylon on the Mechanization of Fishing Operations, by Alan Glanville, FAO Report No. 284, July 1954.

Liberia on the Handling, Processing, and Marketing of Fish, by Jan van Pel, FAO Report No. 286, July 1954.

Italy as the Administering Authority for the Trust Territory of Somalia on the Exploratory Fishery Survey in Somalia, 1952/53, by H. W. Ogdvie, A. Fraser-Brunner, and D. L. Byrd, FAO Report No. 288, August 1954.

FRANCE:

"La Peche et le Marche des Crustaces au Cours des Cinq Dernieres Annees" (The Fishery and the Market for Crustaceans during the Last Five Years), by L. Plouas, article, La Peche Maritime, vol. 39, no. 989, August 1960, pp. 453-457, printed in French. La Peche Maritime, 190, Boulevard Haussmann, Paris, France.

"Le Rapport sur la Production du Comite Central des Peches Maritimes--La Production Française en 1959: 476,000 Tonnes pour Plus de 62 Milliards d'Anciens Francs" (The Production Report by the Central Committee on Maritime Fisheries--French Production in 1959: 476,000 Metric Tons Valued at more than 62 Billion Old Francs), article, La Peche Maritime, vol. 39, no. 989, August 1960, pp. 463-469, printed in French. La Peche Maritime, 190, Boulevard Haussmann, Paris, France.

FREEZER TRAWLERS:

"Recent Developments in Propulsion Machinery and Freezing Equipment for Deep-Sea Trawlers," by G. C. Eddie, article, Shipbuilder and Marine Engine Builder, May 1958, pp. 3-8, printed. Shipbuilder and Marine Engine Builder, Newcastle-on-Tyne, London, England.

FREEZERS:

"New Vertical-Plate Freezer Steps Up Performance," by Arthur V. Gemmill, article, Food Engineering, vol. 32, April 1960, pp. 66-68, printed. Food Engineering, McGraw-Hill Publishing Co., Inc., 330 W. 42nd St., New York 36, N. Y.

FRENCH ANTILLES:

"La Peche aux Antilles et en Guyane Francaise" (The Fishery in the Antilles and French Guiana), by Jean Morice, article, pour l'Expansion Economique des Departements d'Outre-Mer, no. 1, July 1960, pp. 19-22, illus., printed in French. Societe d'Assistance Technique et de Credit Social d'Outre-Mer, 235, Boulevard Saint-Germain, Paris (VII^e), France.

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FRENCH POLYNESIA:

"The Utilization of Marine Resources in French Polynesia," by Michel Angot, article, South Pacific Bulletin, vol. 10, no. 3, July 1960, pp. 46-50, illus., printed. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia. Reviews fishery and other marine resources of the Windward Islands, Leeward Islands, the Tuamotu Group, and the Marquesas, and discusses methods and problems of exploiting them. Covers the type of vessel used, method of fishing, and species landed in the lagoons, on reefs, outside the reefs but within sight of land, and in the deep-sea fisheries. Describes the marketing systems within and outside the Society Islands and mother-of-pearl shell--the one marine export product.

FROZEN STORAGE:

"Odor Transference from Fish to Butter and Fried Chicken During Frozen Storage," by Ernest A. Fieger and Arthur F. Novak, article, Quick Frozen Foods, vol. 23, no. 1, August 1960, pp. 94-96, printed. Quick Frozen Foods, E. W. Williams Publishing, Inc., 82 Wall St., New York 5, N. Y. A study was conducted over a three-year period to determine if odors from fish would be transferred to fried chicken and butter during frozen storage. Results showed that proper packaging can prevent transfer of odors from one food to another.

GREAT LAKES:

"Canada's Great Lakes Research Program," by D. V. Anderson, article, The Conservationist, August-September 1960, pp. 2-5, 34, illus., printed. The Conservationist, Rm. 335, State Campus, Albany, N. Y. The author reports on a long-range, comprehensive study of Canada's Great Lakes. The program received a great boost in 1958 with the loan from the Royal Canadian Navy of the Porte Dauphine, a 125-foot, 400-ton vessel, easily adapted to research work. From April 1959 to March 1960, this vessel covered 17,000 miles, concentrating on Lake Ontario but cruising in the other lakes as well. Valuable hydrographic, biological, and meteorological data were collected. The vessel was sponsored by the University of Toronto and cooperatively supported by Federal and provincial agencies.

HALIBUT:

"Variations in Chemical Composition of Different Parts of Halibut Flesh," by Claude E. Thurston and Patricia P. MacMaster, article, Food Research, vol. 25, March-April 1960, pp. 229-236, printed. Food Research, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

IRRADIATION PRESERVATION:

Food Irradiation Quarterly International Newsletter, vol. 1, no. 1, July-September 1960, 39 pp., processed. O.E.E.C. Mission, Publications Office, Suite 1223, 1346 Connecticut Ave., N. W., Washington 6, D. C. The first issue of a new quarterly published by the European Information Center for Food Irradiation. Contains, among others, an article entitled: "U. S. Government Increases Activity in Radiation Processing of Foods," by Eugene W. Scott. Also discusses the inauguration of the European information center for food irradiation; study of O.E.E.C. for a European Food Irradiation Center; and threshold for induced radioactivity in irradiated foods. The publication also contains reports on meetings, schol-

arship and study opportunities, and a selected bibliography.

"Tooling Up for Low Dose Irradiation Processing of Fresh Foods," by Warren W. Eukel and Wolfgang Huber, article, Food Technology, vol. 14, April 1960, pp. 198-203, printed. Food Technology, The Garrard Press, 510 No. Hickory St., Champaign, Ill.

LABOR LEGISLATION:

Supplement to Federal Labor Laws and Agencies (1960 Supplement to Bulletin 123), 75 pp., printed, 30 cents. Bureau of Labor Standards, U. S. Department of Labor, Washington, D. C. (Available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This booklet will serve as a guide to the layman on matters pertaining to labor-management relations, social security, employment security, and working conditions. It discusses in detail the Labor-Management Relations Act (Taft-Hartley Act); Labor-Management Reporting and Disclosure Act of 1959; Welfare and Pension Plans Disclosure Act; Social Security Act; Railroad Retirement Act; unemployment insurance legislation; Safety Amendment to Section 41 of the Longshoremen's and Harbor Workers' Compensation Act; and other labor legislation.

LAKE TROUT:

Further Observations on the Survival of Yearling Lake Trout Planted in South Bay, Lake Huron, by J. C. Budd and F. E. J. Fry, 7 pp., illus., printed. (Reprinted from The Canadian Fish Culturist, no. 26, March 1960, pp. 7-13.) The Queen's Printer and Controller of Stationery, Ottawa, Canada.

Survival and Growth of Tagged Lake Trout in South Bay, Lake Huron, by John C. Budd, 2 pp., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 89, no. 3, 1960, pp. 308-309.) The American Fisheries Society, Librarian, Colorado A. and M. College, Fort Collins, Colo.

MADAGASCAR:

Bulletin de Madagascar, vol. 10, no. 171, August 1960, 80 pp., illus., printed in French. Service General de l'Information, Place Colbert, Tananarive, Madagascar. Includes, among others, an article on the inland fisheries entitled, "Monographie du Lac de Tampolo-Fenerive" (Monograph on the Lake of Tampolo-Fenerive), by A. Kiener. With the granting of self-governing status to this former French colony, Madagascar is now known as the Malagasy Republic.

MARINE BORERS:

Marine Borer Investigations, Final Report 60-1, May 1960, 37 pp., illus., processed. The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

MARKING FISH:

The Use of Lead Versenate to Place a Time Mark on Fish Scales, by F. E. J. Fry and others, 5 pp., illus., printed. (Reprinted from Transactions of the American Fisheries Society, vol. 89, no. 2, 1960, pp. 149-153.) The American Fisheries Society, Librarian, Colorado A. and M. College, Fort Collins, Colo.

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MELANESIA:

"SPC Fisheries Investigations in Melanesia," by H. van Pel, article, *South Pacific Bulletin*, vol. 10, no. 3, July 1960, pp. 25-28, illus., printed. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia.

MIDWATER TRAWLING:

Midwater Trawling Studies in the North Pacific, by William Aron, 10 pp., illus., printed. (Reprinted from *Limnology and Oceanography*, vol. 4, no. 4, October 1959, pp. 409-418.) Woods Hole Oceanographic Institution, Woods Hole, Mass. Summarizes the results of midwater trawling studies conducted in the North Pacific by the research vessel Brown Bear of the University of Washington, Department of Oceanography, during the summer of 1957. The trawl studies were made on a cruise devoted primarily to research for the International Geophysical Year program. The trawling studies were primarily exploratory--to find out what animals inhabit the depths under study and also to obtain some idea of their relative abundance. Within these two major objectives, information was desired regarding the horizontal and vertical distribution of trawl-caught animals and the relationship between these distributions and the oceanographic data which were obtained during the course of the work.

NETHERLANDS:

Jaarcijfers over de Visserij Gedurende het Jaar 1959 (Annual Fisheries Statistics, 1959), No. 51, 163 pp., illus., printed in Dutch with English titles and summaries, and statistical tables in both Dutch and English. Directie van de Visserij, 's-Gravenhage, Netherlands, 1960. A review of Dutch fisheries during 1959 covering the sea, inshore, and river and inland fisheries; Government regulations; whaling; export of salted and smoked herring; fisheries research; and fishing vessels. The second half of the report is devoted to statistical tables showing number and tonnage of fishing vessels of various types; quantity and value of fish and shellfish landed at each port by Dutch and foreign vessels; extent and outcome of the drift-net, trawl, and Danish seine fisheries; landings in the various coastal and inland fisheries; whaling results; outcome of the salmon and other pelagic fisheries; and other pertinent data.

NORWAY:

"Fiskernes Inntektsnivå i 1958" (Investigation of Fishermen's Income in 1958), article, *Fiskets Gang*, vol. 46, no. 28, July 14, 1960, pp. 417-422, printed in Norwegian. Fiskets Gang, Postgiron Nr. 691 81, Bergen, Norway.

NYASALAND:

Annual Report of the Department of Game, Fish and Tsetse Control for the Year Ended 31st December 1959, 32 pp., printed. The Government Printer, Zomba, Nyasaland, 1960. The section of fisheries discusses the state of the fish stocks, the non-African fishery, the African fishery, the fish trade, developmental and experimental work, fisheries research organizations, trout fishing, and fish farming. Also includes tables showing results of experimental work done with various types of floats, different colors of nets, and other similar data.

ORGANIZATION FOR EUROPEAN ECONOMIC COOPERATION:

Fishery Policies in Western Europe and North America, 302 pp., illus., printed \$3. OEEC Mission, Publications Office, Suite 1223, 1346 Connecticut Ave., NW., Washington 6, D. C. September 1960. A report describing the fishery policies of the 18 Western European member countries of the Organization for European Economic Cooperation. The members are Austria, Belgium, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, and the United Kingdom. The United States and Canada participated in the work as associate members. Yugoslavia is represented by an observer but since July 1959 has participated on an equal basis with member countries in work on agriculture and food. The report covers: conditions in the fisheries of each country--size of fleet and vessels, production, utilization, consumption, imports, and exports; and policies pursued in an effort to improve the condition of the fisheries--duties, quotas, price stabilization schemes, subsidies, low-interest loans, grants, landing bans, and other government programs. The member countries operate fisheries which in 1958 accounted for one-third of the world's total fish production. The increase in the fish production of OEEC countries since the end of World War II has been achieved by the introduction of bigger and more efficient vessels and by improved fishing techniques. While catches per man have risen considerably, catches per ton of fishing vessel have shown a decline. A wide range of fishery policies is employed in the various countries. Measures ranging from general services to schemes for direct financial support have encouraged an expansion of production and a high degree of self-sufficiency in fish supplies in most countries. OEEC countries could, however, by coordinating their fishery policies, make substantial progress in improving the economic position of their fisheries.

"Les Travaux de l'O.E.C.E. sur les Pêcheries Europeennes" (The Work of the O.E.C.E. on European Fisheries), by R. Lagrade, article, *La Pêche Maritime*, vol. 39, no. 989, August 1960, pp. 459-460, printed in French. La Pêche Maritime, 190 Boulevard Haussmann, Paris, France.

OYSTER DRILLS:

"Copper, a Possible Barrier to Oyster Drills," by John B. Glude, article, *Proceedings of the National Shellfisheries Association*, vol. 47, 1958, pp. 73-82, printed. National Shellfisheries Association, U. S. Fish and Wildlife Service, Department of the Interior, Washington 25, D. C.

OYSTERS:

"Microbiology of Shellfish. Bacteriological Study of the Natural Flora of Pacific Oysters (*Crassostrea gigas*)," by R. R. Colwell and J. Liston, article, *Applied Microbiology*, vol. 8, March 1960, pp. 104-109, printed. Applied Microbiology, Williams and Wilkins, Mt. Royal and Guilford Aves., Baltimore 2, Md.

Oyster Mortality Studies by the Chesapeake Biological Laboratory (Preliminary Progress Report), by G. Francis Beaven, L. Eugene Cronin, and Elgin A. Dunnington, Ref. No. 60-25, 6 pp., processed. Mary-

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land Dept. of Research and Education, Chesapeake Biological Laboratory, Solomons, Md., June 30, 1960.

"Studies on Freshness Determination of Fish Meal by the Distillation Ratio of Volatile Acids. IX--On the Applicability of D. R. Value to the Determination of the Freshness of Oyster," by Suezio Asakawa, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 24, no. 9, 1959, pp. 714-718, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-Chome, Tokyo, Japan.

PERU:

La Industria Peruana de Pesca en 1959 (The Peruvian Fishery Industry in 1959), by Javier Iparraquirre Cortez, Serie de Divulgacion Cientifica No. 13, 21 pp., processed in Spanish. Ministerio de Agricultura, Direccion de Pesqueria y Caza, Lima, Peru. The annual report on the Peruvian fisheries for 1959 by the Department of Fisheries and Wildlife. Covers the position of Peru in the world fisheries; fish landings by species; utilization of the catch; freezing and canning of fishery products; and manufacture of fish meal and fish oil. Includes a number of statistical tables showing the quantity and value of fishery products consumed in the greater Lima area; landings of fish and their utilization; foreign trade in fishery products; world production of canned fish and fish meal; and landings of whales.

PESTICIDES:

Some Effects of Pesticides on Marine Arthropods and Mollusks, by Victor L. Loosanoff, 5 pp., processed. (Reprinted from the *Transactions of the Second Seminar on Biological Problems in Water Pollution*, April 20-24, 1959.) Public Health Service, U. S. Department of Health, Education, and Welfare, Washington 25, D. C.

PORTUGAL:

Boletim da Pesca, vol. 13, no. 68, September 1960, 100 pp., illus., printed in Portuguese. Gabinete de Estudos das Pescas, R. S. Bento, 644, 4^o-Esq., Lisbon, Portugal. Contains these articles: "Documentos sobre Higiene de Farinhas de Peixe em Angola" (Papers on Sanitation of Angolan Fish Meal), by E. Tropa and J. Brito Guiterres; "Deficiencias e Potencialidade Economica do Camaron, em Lourenco Marques" (Deficiencies and Economic Potentiality of the Shrimp of Lourenco Marques), by Luis Marques Neto; "Algumas Consideracoes sobre os Elementos de Base para a Exploracao Nacional das Pescas" (Some Considerations on the Basic Elements for a National Fisheries Exploration Program), by F. Marques da Silva; "Teoria e Pratica sobre a Industria da Pesca" (Theory and Practice in the Fishery Industry), by Pompilio da Cruz; and "Os Pescadores de S. Tome" (The Fishermen of S. Tome), by Jose Marques Elpidio.

QUALITY:

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_____, vol. 8, no. 3, March 1960, 32 pp.; "The Different Uses of Sharks (Part II)," by Fahmi Ersan; and "Methods of Extraction of Oils from Fish Livers (Part I)," by Hikmet Akgunes.

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Marine Sciences Newsletter, no. 1, November 1959, 23 pp., processed. UNESCO Science Cooperation Office for Southeast Asia, Djl. Diponegoro 76, Box 2313, Djakarta, Indonesia. A new publication of the UNESCO Science Cooperation Office for Southeast Asia, published irregularly. One important aim of UNESCO's program in the natural sciences is to contribute to improving living conditions of mankind by the promotion of scientific knowledge in order that a greater and better use may be made of natural resources. In Southeast Asia, of course, where there is an extremely extended coastline, development of marine sciences is of the greatest importance. To aid in this work, UNESCO established in 1956 the International Advisory Committee on Marine Sciences, whose task is to advise it on its program of research in the marine sciences. This issue of the *Newsletter* includes, among others, these articles: "International Oceanographic Congress and 4th Session of International Advisory Committee on Marine Sciences," "Symposium on Alology," and "Films on Fisheries and Marine Science."

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Fisheries of Scotland Report for 1959, 100 pp., printed, 5s. 6d. (about 77 U. S. cents). Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland, July 1960. (Available from Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland.) This report discusses the changes which took place in the Scottish fishing fleet during 1959 as well as details of the catch. It also includes in the appendices reports on fisheries research and harbors. A number of statistical tables are included in the report which deal with quantities and values of fish landed,

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number of vessels and fishermen engaged in the fisheries, and production of fishery byproducts. The Marine Laboratory at Aberdeen continued its investigations of herring, brown trout, and salmon. Emphasis in research was placed on the environmental aspects--hydrography, nutrients in the sea, and plankton and bottom fauna--and on chemical work--fertilization of lochs, phosphorus content of bottom deposits and macrophytes, and chemical changes in unpolluted rivers.

Scottish Sea Fisheries Statistical Tables, 1959, 48 pp., printed, 5s. (about 70 U. S. cents). Department of Agriculture and Fisheries for Scotland, Edinburgh 1, Scotland, July 15, 1960. (Available from Her Majesty's Stationery Office, 13A Castle St., Edinburgh 2, Scotland.) Contains 24 statistical tables showing fish landed and cured, vessels and fishermen, and creek returns. Tables 1 through 17 cover quantity and value of fish landed by British and foreign vessels; landings of British vessels according to method of fishing, 1938-59; quantity, value, and average value of each kind of fish landed by British vessels in 1913, 1938, and 1952-59; and quantity and value of each kind of fish landed in specific districts by British vessels of various types. They also cover quantity of each kind of fish landed and expenditure of fishing effort in each fishing region by British vessels; quantity of each kind of fish landed by foreign vessels from each fishing region and quantity and value of fish landed by each nationality; and seasonal landings of herring. Tables 18 through 20 show quantity of herring cured, 1913-59 and quantity and value of white fish cured and herring cured in each district, according to method of cure. Tables 21 through 23 show fishing vessels; fishermen employed; and greatest number of vessels and persons employed in each district in any week. Table 24 shows number of vessels and fishermen and quantity and value of fish landed in creeks.

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U. S. S. R.

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The Effect of Mechanical Agitation on Developing Eggs of the Pink Salmon ONCORHYNCHUS GORBUSCHA (Walbaum), Salmonidae, by A. I. Smirnov. Translation Series No. 231, 5 pp., processed, 1959. (Translated from Doklady Akademii Nauk SSSR, vol. 97, no. 2, 1954, pp. 365-368.)

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sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) Weather Bureau, U. S. Department of Commerce, Washington 25, D. C. Charts show stations displaying storm warnings, small craft, storm and hurricane warnings and explanations, and schedules of AM and FM radio and TV stations that broadcast weather forecasts and warnings: 8P--Canadian Border to Eureka, Calif.; 9P--Cape Hatteras to Brunswick, Ga.; 10P--Eastport, Maine, to Montauk Point, N. Y.; 11P--Eureka to Point Conception, Calif.; 12P--Eastern Fla.; 13P--Hawaiian Islands; 14P--Manasquan, N. J., to Cape Hatteras and Chesapeake Bay; 15P--Montauk Point N. Y., to Manasquan N. J.; 16P--Morgan City, La., to Apalachicola, Fla.; 17P--Morgan City, La., to Brownsville, Texas; 18P--Point Conception, Calif., to Mexican Border; and 19P--Puerto Rico and Virgin Islands.

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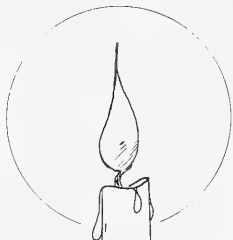
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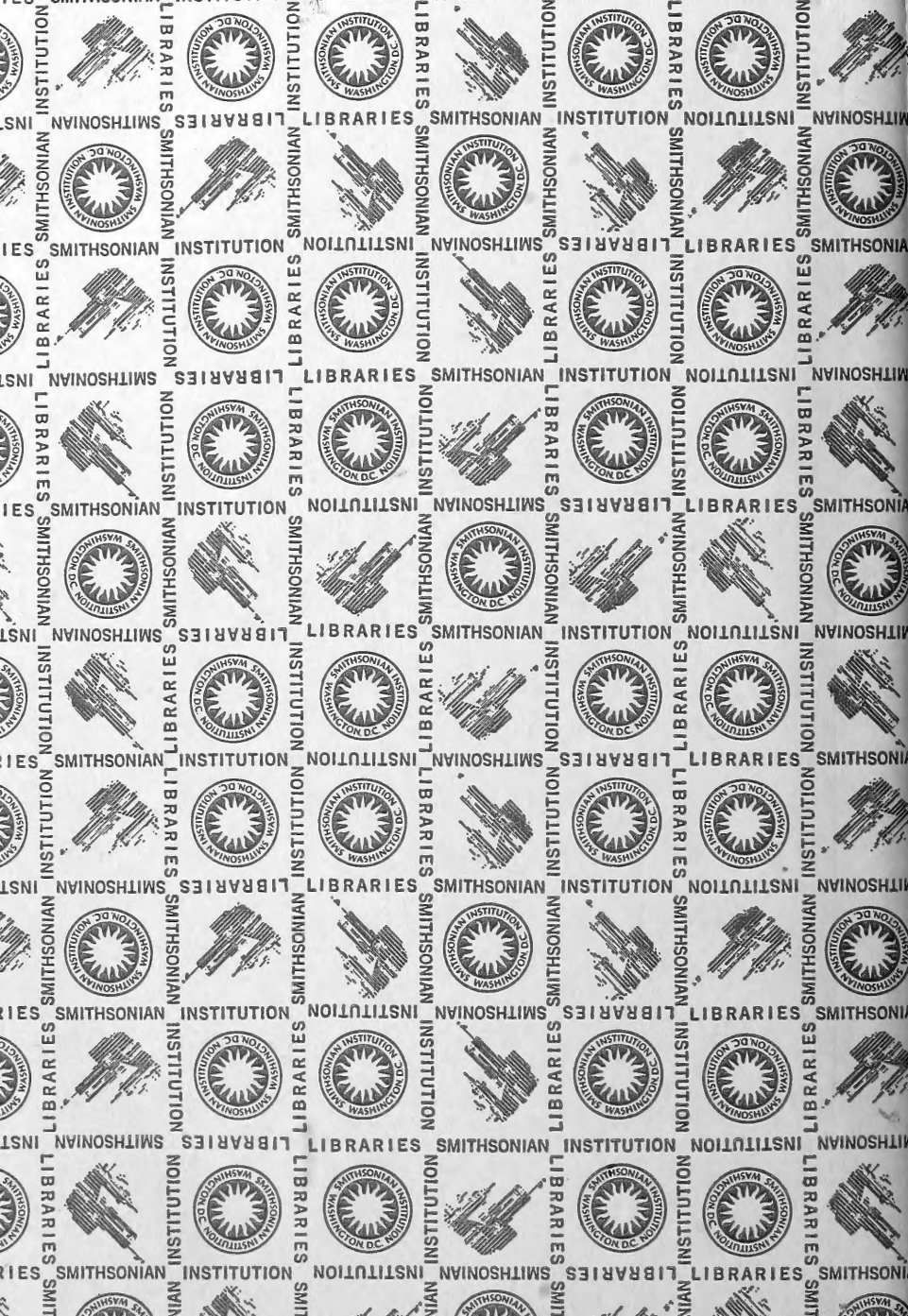


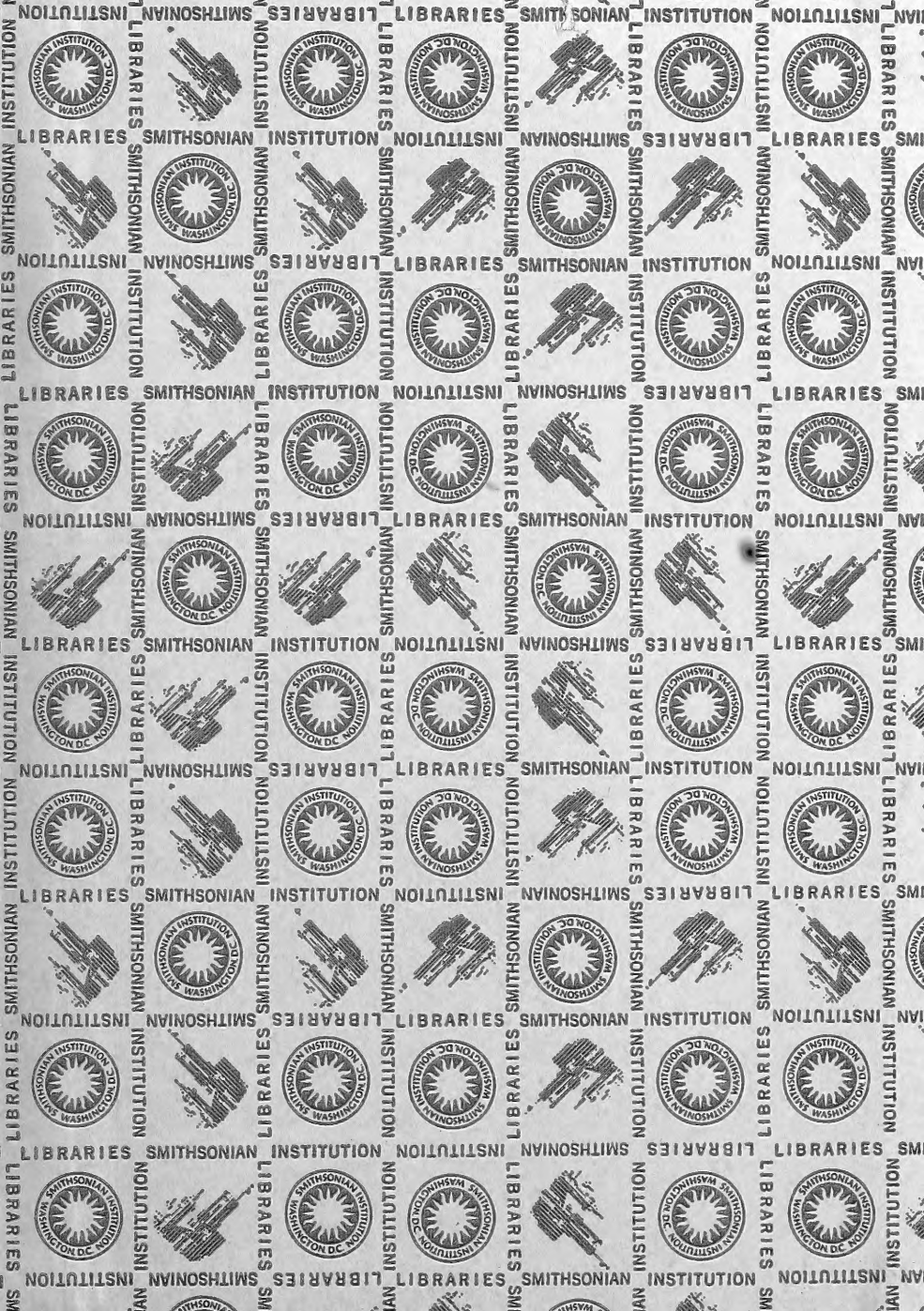


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