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# COMMERCIAL FISHERIES REVIEW



Vol. 23, No. 2

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# COMMERCIAL FISHERIES REVIEW



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

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## MACHINE HARVESTS IRISH MOSS

Seaweeds are difficult to harvest and Irish moss particularly so. The alga grows to about 3 to 5 inches in length and normally attaches itself to rocky, uneven sea bottoms. Up to now, these plants had to be harvested by hand. Earl C. Jertson of Fairhaven, Mass., has now invented a machine capable of detaching large quantities of Irish moss from the sea floor and bringing it to the surface. It was awarded U. S. Patent No. 2,941,344.

In essence, the device consists of an endless chain, similar to a rope ladder in shape. Rakes are attached to each of the "rungs" so they point along the chain. The ladder arrangement is fed out from one end of a boat and in at the other. The flexible rake-ladder follows the contours of the sea floor and catches the plants to be harvested.

The Irish moss is torn off the rocks and carried up to the boat where it is removed while the rakes are protected from all but the smallest rocks by the sides of the chain. Jertson assigned his patent to Marine Colloid, Inc., of Delaware. (Science News Letter, July 9, 1960.)




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## GULF OF MEXICO TRAWL FISHERY FOR INDUSTRIAL SPECIES

By Winthrop A. Haskell\*

### ABSTRACT

During 1958 and 1959, sampling of the trawl-caught industrial fish, used chiefly in the petfood industry of the northern Gulf, showed the large variety of species taken, but about three-fourths of the catch consisted of croaker (*Micropogon undulatus*), spot (*Leiostomus xanthurus*), and silver trout (*Cynoscion nothus*). Fish are taken in the area from Mobile Bay to Ship Shoals in western Louisiana. The area fished comprises about 4,000 square miles between 0 and 20 fathoms. The bulk is taken east of the delta--the fishing west of the delta occurring chiefly during the winter months.

### INTRODUCTION

Shrimp vessels in the Gulf of Mexico incidentally catch large quantities of fish of species and sizes unmarketable as human food. These fish were formerly discarded at sea and wasted, being invariably dead when thrown overboard. Although some of the incidental catches by

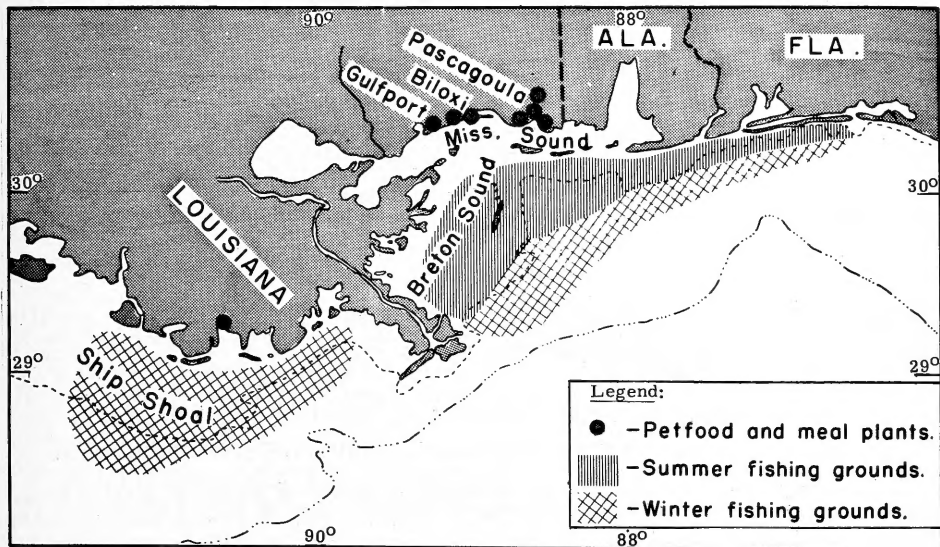


Fig. 1 - Fishing grounds used by trawlers of the industrial fishery in the Gulf of Mexico.

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shrimp vessels are landed, the bulk of the industrial trawl-caught fish on the Gulf Coast are caught by vessels fishing primarily for industrial fish.

A plant established at Pascagoula, Miss., in 1952, successfully experimented with the use of these discarded fish for petfood. The fishery grew rapidly when several additional plants in the northern Gulf area started processing the discarded fish. Some of these formerly-wasted bottom fish are quick-frozen in 50-pound blocks for use as animal food in the fur-farming industry, some are processed into canned petfoods, and some are converted into fish meal (utilized as a protein supplement in other animal foods such as prepared poultry rations).

The Feline Society, Inc., estimates that there are about 21 million cats in North America<sup>1</sup>. In 1958, the public spent more for petfoods than for baby foods (Coleman 1960). Recognition of the growing importance of this industry is shown by the inauguration on February 15, 1960, by the U. S. Department of Agriculture of the official inspection seal on petfoods which pass inspection (Gruber 1960).

Table 1 - Value of Total United States Petfood Consumption, 1958

Canned catfoods . . . . .	\$220,200,000
Canned dogfoods . . . . .	41,770,000
Other cat and dog foods . . . . .	192,200,000
Total . . . . .	\$485,620,000

A New England industrial trawl fishery developed about 10 years ago and has increased to approximately one-third of the total landings for the area in 1959 (Jones 1959). A brief survey of the "trash" fishery was made in New England in 1949 (Snow 1950). Then at the request of the Atlantic States Marine Fisheries Commission, a systematic sampling of landings was begun in 1950 (Sayles 1951). In 1955 a biological study was initiated (Edwards 1958a). This fishery takes only 44 species (Edwards 1958a) as compared to 175 species so far identified in Gulf of Mexico industrial fish landings. However, Gulf landings commonly consist of about 25 species, and the remainder appear incidentally.

The California petfood industry, which, like that in the Gulf, began in 1952, utilizes frozen whole fish, fish frames, and viscera. But the industry has grown in practically every area in California where there is a trawl fishery and it is using more than 3 million pounds of whole fish and 8 million pounds of fish scraps. California made an intensive study of their animal-food fishery in 1956 and 1957 (Best 1959 and Gates 1955). It is felt that the new fishery is not harming the bottom fish resources of the State (Best 1959). There appears to be room for enormous expansion of this fishery in the Northwest to at least 200 million pounds according to Jones (1959).

At present no large-scale petfood industry utilizing discarded species exists except in California, New England, and the northern Gulf of Mexico (Jones 1959-1960), although a potential exists in all areas where a trawl fishery operates, even in the Great Lakes States and the Arkansas farmlands (Jones *op. cit.*). The Gulf of Mexico fishery could be expanded into deeper unfished waters, and the potential for increased utilization of bottom fish is very great (Vincep 1950).

## THE FISHERY

**FISHING FLEET:** The fleet in the Gulf of Mexico is comprised largely of small converted shrimp vessels averaging 33 gross tons, 53 feet in length, 185 hp., and 16½ years of age. The vessels fish with modified shrimp trawls, chiefly of 2-inch stretched mesh with a 1-inch bar-mesh liner in the cod end. This liner strengthens the cod end to withstand the heavy weight of a haul of fish. There are minor variations in gear and rigging from vessel to vessel. The two main types of vessels are "Florida"- and "Biloxi"-type trawlers.

**GROUND AND FISHING DEPTHS:** The industrial trawl fishery presently fishes only some 4,000 square nautical miles in the Gulf between 0 and 20 fathoms. Mississippi Sound and closely adjacent waters contribute approximately 65 percent of the catch. Most of the balance is caught from waters west of the Mississippi River between Empire and Ship Shoals, La.

<sup>1</sup>Wildlife Review, 1960, Fish and Game Branch, Department of Recreation and Conservation, no. 5, vol. 2 (April), Vancouver, B. C., p. 7.

The waters fished most heavily and consistently are from just east of Mobile Bay entrance (Alabama) to south of Chandeleur Island, Miss. In summer, fishing depths range mainly from 2 to 7 fathoms and in winter from 8 to 20 fathoms, but rarely deeper although the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon explorations show large numbers of bottom fish are available in deeper waters. If the fishery continues to expand, it will likely be extended farther offshore.

At times, some industrial fish landed at Apalachicola, Fla., have been shipped by truck to plants in Mississippi when landings were low in the Pascagoula area. Large schools of pelagic thread herring (Opisthonema oglinum) present off the west coast of Florida in the summer months, have been caught in seines and used to a limited extent to supplement trawl-caught fish landings at Pascagoula, Miss.

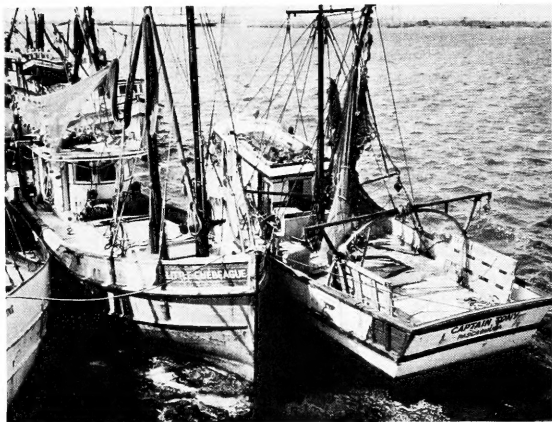


Fig. 2 - A single- and a double-rig trawler at a petfood plant in a Gulf Coast port.

During the winter many boats from the Biloxi-Pascagoula area of Mississippi, especially those of larger size, fish west of the Mississippi River. Fishing is normally better there during the winter months, and parts of the western grounds are more sheltered from prevailing northeast winds. Depths fished approximate those utilized to the east, although depths to 29 fathoms are occasionally trawled.

Shallow waters extend far offshore and are characterized by a rich and varied ichthyofauna. Extensive inshore estuarine areas serve as nursery grounds for many species of fishes occurring in this fishery. The 10-fathom curve averages about 10 miles seaward, and the 100-fathom curve generally extends about 60 miles offshore, forming an unusually wide, shallow shelf. The bottom over this huge area is gray mud or gray sand and is almost level, making excellent bottom-trawling conditions.

**HANDLING THE FISH:** The fish are brought aboard the vessel in the net, dumped into the fish hold, and iced down with crushed ice carried from the home port. During this icing process much of the undesirable material, such as seashells, crabs, starfish, and sharks, is culled out and thrown overboard.

Unloading processes at the ports vary. Some plants use a suction pump in which a flexible metal pipe is lowered into the hold of the vessel and the fish flushed into the pipe by high pressure streams of water. They are sucked up through the pipe into a washer and come out onto a metal-link conveyor belt where remaining undesirable material, such as shell, seaweed, sharks, rays, crabs, and sea lice, is picked out by hand. The fish then cross a scale for weighing and go into the plant for grinding, cooking, and ultimate canning as the finished product. In other plants the fish are shoveled into buckets and hoisted to the dock or shoveled onto an endless conveyor, which moves them into the plant.

Quantities of extraneous material cause delays in processing. The fishermen, therefore, endeavor to make their catch as clean and free as possible from unusable species by avoiding concentrations of food fish or shrimp. Petfood plant operators are very particular about the quality and condition of fish delivered to their plants; slight spoilage will cause a load to be rejected. The rejected fish are normally made into fish meal or discarded.

**SPECIES COMPOSITION IN GULF OF MEXICO FISHERY:** The dominant species, croaker (*Micropogon undulatus*), spot (*Leiostomus xanthurus*), and silver trout (*Cynoscion nothus*), are present in all waters fished throughout the year and make up approximately 75 percent of the total industrial trawl fishery catch. Croakers average about 50 to 55 percent of the total catch by weight throughout the year. There appears to be little coastwise migratory movement of croakers in the northern Gulf, such as is reported for the Chesapeake Bay area (Haven 1957 and 1959; Massman and Pacheco 1960), although Suttks (1955) recorded considerable

Table 2 - Species Composition of Gulf of Mexico Industrial Trawl Fishery Catches by Weight, 1959

Species	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Anchovy ( <i>Anchoa</i> sp.) (2 species) . . . . .	-	1.18	1.62	2.72	1.44	1.92	2.05	1.73	2.18	-	-	-
Butterfish ( <i>Foronotus tricanthus</i> ) . . . . .	-	-	-	-	1.24	-	-	-	-	2.75	-	-
Catfish, sea ( <i>Galeichthys felis</i> ) . . . . .	2.41	1.79	3.34	3.03	5.76	4.35	4.71	3.86	4.73	1.65	1.25	-
Croaker ( <i>Micropogon undulatus</i> ) . . . . .	41.41	62.98	49.81	53.65	51.74	55.65	46.02	44.02	41.04	40.20	54.97	55.17
Croaker, banded ( <i>Larimus fasciatus</i> ) . . . . .	2.19	1.50	-	2.60	-	-	-	-	1.17	2.12	-	-
Flounder ( <i>Paralichthys</i> sp.) (2 species) . . . . .	-	-	-	-	-	-	-	-	-	-	-	1.30
Lizardfish ( <i>Synodus foetens</i> ) . . . . .	-	-	-	-	1.12	-	-	-	-	2.06	5.76	3.82
Menhaden ( <i>Brevoortia</i> sp.) (3 species) . . . . .	3.28	-	1.69	2.54	2.21	4.27	1.12	-	-	4.32	6.13	1.00
Pogy ( <i>Stenotomus</i> sp.) (2 species) . . . . .	-	3.72	3.48	2.28	6.99	-	-	-	-	-	-	1.65
Razorbelly ( <i>Harengula pensacolae</i> ) . . . . .	-	-	-	2.13	3.50	10.24	3.26	2.64	3.79	5.01	1.77	-
Sea robin ( <i>Prionospis</i> sp.) (2 species) . . . . .	-	-	1.26	-	-	-	-	-	-	-	-	1.25
Silver eel ( <i>Trichiurus lepturus</i> ) . . . . .	-	-	-	1.62	3.42	4.13	6.11	4.08	7.23	7.66	1.05	-
Spot ( <i>Leiostomus xanthurus</i> ) . . . . .	29.34	9.03	5.80	10.95	9.00	12.81	17.35	11.89	16.70	9.48	4.96	20.99
Star drum ( <i>Stellifer lanceolatus</i> ) . . . . .	-	-	-	2.36	2.11	-	-	-	-	-	-	-
Threadfin ( <i>Polydactylus octonemus</i> ) . . . . .	-	-	-	-	-	1.19	1.94	1.90	-	-	-	-
Trout, silver ( <i>Cynoscion nothus</i> ) . . . . .	12.45	13.23	24.91	10.13	3.18	2.31	5.55	8.26	11.32	13.50	6.51	2.66
Whiting ( <i>Menticiclus</i> sp.) (2 species) . . . . .	1.65	2.15	-	-	1.82	-	1.52	1.28	1.86	1.71	3.46	3.78
Miscellaneous (less than 1%) . . . . .	7.27	4.42	8.09	5.99	6.47	3.13	10.37	20.34	9.98	9.54	14.14	8.38

seasonal movement along the Louisiana east coast from Lake Pontchartrain. A tagging program is needed to provide more detailed knowledge of local migrations.

Spot and silver trout constitute about 10 percent, respectively, while miscellaneous species comprise the balance of the catch. Other species contributing heavily to the total catch according to the season of the year are hardhead catfish (*Galeichthys felis*), razorbellies (*Harengula pensacolae*), lizardfish (*Synodus foetens*), cutlassfish (*Trichiurus lepturus*), and Atlantic threadfin (*Polydactylus octonemus*). Some species, such as, razorbellies and threadfin, disappear from the fishery during the winter months and reappear as the water warms in the spring.

Species generally termed "sport fish" or "food fish" are rarely caught, comprising less than one-half of one percent of the total catch. Out of 175 species identified, only about 20 species might be termed "sport fish." Of these 20 species many occur so infrequently as to be considered rare or unusual. The effects of the trawl fishery on sport fish and shrimp were reviewed by Gunter (1956), who felt it was not damaging to those species.

In New England, studies by Morrow (1951) of the long-horned sculpin and the "trash" fishery indicated "... continuation of the fishery might actually have a beneficial effect on the fishing industry as a whole in this region."

The silver trout commonly caught in large numbers is generally regarded as an inferior sport fish when compared to the other sea trouts (such as, the speckled trout, *Cynoscion nebulosus*, and sand trout, *Cynoscion arenarius*) both because of the small size usually attained and the rapid softening and deterioration of the meat.

In December and January 1958-59, 369,536 pounds of trawl-caught industrial fish were landed at Pascagoula, Miss. From 12 random 20-pound samples with a total of 437.3 pounds, 17 red snapper (*Lutianus aya*) were taken amounting to only 0.63 percent by weight. The percentage is considerably lower, for most other species. Studies of fish taken in shrimp trawls (Siebenaler 1952 and 1953<sup>2</sup>; and Miles 1951<sup>3</sup>), gear similar to that of the industrial trawl fishery, also indicated the rare occurrence of "sport fishes" in trawl catches.

<sup>2</sup>/Siebenaler, J. B., 1953. "Fishes Taken by the M/V Oregon in Shrimp Trawls off the Coast of Mississippi, 1950-1952." Unpublished report, mimeo., 7 pp.

<sup>3</sup>/Miles, Robley M., 1951. "An Analysis of the 'Trash Fish' of Shrimp Trawlers Operating in Apalachicola Bay and the Adjacent Gulf of Mexico." Unpublished manuscript thesis, Florida State University, 46 pp.

A total of 636 landings have been sampled in 19 months. These samples show that with rare exceptions all fish taken in industrial fish trawls are of small size, even when mature, and hence are unsuitable for either human consumption or sport fishing. The average size of a mature fish is about 5 to 8 inches.

Croaker, spot, and silver trout are the dominant species both east and west of the Mississippi River. However, at times, almost an entire catch will consist of a single species, usually cutlassfish or silver trout. The average size of fish is slightly larger west of the delta.

The few flounders (Paralichthys sp.) taken are sold for human consumption, but even this species occurs in very small numbers and only in the summer months. Striped sole (Achirus lineatus), hogchoker (Trinectes maculatus), and tongue sole (Symphurus plagiusa), all of very small size, are the most common flatfish appearing in industrial fish landings.

Studies of gonad development reveal that some of the species common to the northern Gulf area spawn throughout the calendar year.

**SPECIES COMPOSITION - OTHER FISHERIES:** In the New England industrial trawl fishery red hake (Urophycis chuss) is the principal species, comprising 68 percent of the New Bedford landings for 1956 (Edwards and Lux 1958). This species compares in importance to the croaker of the Gulf fishery. Without these two species no industrial fishery would exist in either area. Other important species of the New England fishery are whiting (Merluccius bilinearis), comprising about 13 percent, and two skates (Raja erinacea and Raja ocellata), comprising 7 percent in 1956. The four species constitute the greatest part of all industrial species landed in New England. There are a total of 44 species as compared to 175 species in the Gulf fishery and 35 species in the California area.

Thirty-five species have been observed in the animal-food landings in California. Of these, arrowtooth flounder (Atheresthes stomias), Pacific hake (Merluccius productus), and the sablefish (Anoplopoma fimbria) make up approximately 75 percent by weight of all fish used in animal foods. These fishes are also unmarketable by reason of size or species and were previously discarded at sea (Best 1959) as in the Gulf shrimp fishery.

#### SUMMARY AND CONCLUSIONS

For many years shrimp fishermen have been discarding large quantities of finfish incidentally caught with their shrimp fishing. In 1952 a pilot plant in Pascagoula, Miss., commenced utilizing these otherwise unmarketable fish for petfood. Most of these fish, which were formerly discarded, are quick-frozen for use in the fur-farming industry, canned as petfood; or made into fish meal (used as a protein supplement in prepared animal rations). The new industry has expanded rapidly, and there is every indication it will continue to grow.

Intensive sampling of landings since January 1959 shows croaker, spot, and silver trout to be the dominant species throughout the year in the Gulf of Mexico industrial trawl fishery. Other important species are razorbellies, lizardfish, Atlantic threadfin, and hardhead catfish, but a total of 175 species from 76 families have been identified thus far. Sport fish and food fish contribute a negligible part of the total catch of bottom fish.

Individuals in the dominant species group rarely grow over 5 to 8 inches even when fully mature. Life history studies show that some species spawn throughout the year in the northern Gulf area.

Fishing grounds extend from Perdido Bay, Fla., on the east to Ship Shoals, La., on the west, in depths ranging from 2 to 29 fathoms of water.

Indications of a growing market for petfood for some 21 million cats in North America and the large potential yield of the bottom fishery of the Gulf appear to favor expansion of the industrial fishery. There are no indications that the industry is adversely affecting pres-

ently-exploited populations. Fishing could be extended into deeper unfished waters, and the potential for increased utilization of bottom fish is very great.

## LITERATURE CITED

- BEST, E. A.  
1959. Status of the Animal Food Fishery in Northern California, 1956 and 1957. California Fish and Game, vol. 45, no. 1 (January), pp. 5-18, Sacramento, Calif.
- COLEMAN, WILLIAM C.  
1960. For Every Dollar Spent for Pet Foods . . . Petfood Industry, vol. 2, no. 2 (February), pp. 20-21.
- EDWARDS, ROBERT L.  
1958a. Species Composition of Industrial Trawl Landings in New England, 1957. U. S. Fish and Wildlife Service, Special Scientific Report--Fisheries No. 266, July, 23 pp., Washington, D. C.  
1958b. Gloucester's Trawl Fishery for Industrial Fish. Commercial Fisheries Review, vol. 20, no. 8 (August), pp. 10-15. (Also Separate No. 519.)
- EDWARDS, ROBERT L., and LUX, F. E.  
1958. New England's Industrial Fishery. Commercial Fisheries Review, vol. 20, no. 5 (May), pp. 1-6. (Also Separate No. 509.)
- GATES, DOYLE E.  
1955. Preliminary Report on the Status of Trawling for Animal Food in Northern California. California Department of Fish and Game, Marine Fisheries Branch, mimeo., 7 pp., Sacramento, Calif.
- GRUBER, GILBERT S.  
1960. New Government Inspection Seal for Pet Foods. Petfood Industry, vol. 2, no. 3 (March), pp. 14-16, 27.
- GUNTER, GORDON  
1956. Should Shrimp and Game Fishes Become More or Less Abundant as Pressure Increases in the Trash Fishery of the Gulf of Mexico? Louisiana Conservationist, January, pp. 11, 14-15, 19, New Orleans, La.
- HAVEN, DEXTER S.  
1957. Distribution, Growth, and Availability of Juvenile Croaker, Microgogon undulatus, in Virginia. Ecology, vol. 38, no. 1 (January), pp. 88-97.  
1959. Migration of the Croaker, Microgogon undulatus. Copeia, no. 1, April, pp. 25-30.
- JONES, WALTER G.  
1959a. Sources of Lake Fish for Pet Foods. Petfood Industry, vol. 1, no. 3 (March), pp. 21, 25.  
1959b. Fish for Petfoods in the Gulf of Mexico. Petfood Industry, vol. 1, no. 5 (May), pp. 10-11, 42, Sea Isle City, N. J.
- JONES, WALTER G., (Contd.)  
1959c. Fish for Pet Foods in the Pacific Northwest. Petfood Industry, vol. 1, no. 6 (June), pp. 34-36.  
1959d. Fish for Pet Foods from the Arkansas Farmlands. Petfood Industry, vol. 1, no. 8 (August), pp. 21-23, 47.  
1959e. Fish for Pet Foods - the New England Industrial Fisheries. Petfood Industry, vol. 1, no. 9 (September), pp. 18-19, 38.  
1960. Fish for Pet Foods - South Atlantic Coast. Petfood Industry, vol. 2, no. 1 (January), pp. 17-18.
- MASSMANN, WILLIAM H., and PACHECO, ANTHONY L.  
1960. Disappearance of Young Atlantic Croakers from the York River, Virginia. Transactions of the American Fisheries Society, vol. 89, no. 2, pp. 154-159.
- MORROW, JAMES E., Jr.  
1951. Studies on the Marine Resources of Southern New England. VIII. The Biology of the Longhorn Sculpin, Moxocephalus octodecemspinosus Mitchell, with a Discussion of the Southern New England "Trash" Fishery. Bulletin of the Bingham Oceanographic Collection, vol. 13, Art. 2, February, 89 pp., New Haven, Conn.
- SAYLES, RICHARD E.  
1951. The Trash Fishery of Southern New England in 1959. Commercial Fisheries Review, vol. 13, no. 7 (July), pp. 1-4. (Also Separate No. 286.)
- SIEBENALER, J. B.  
1952. Studies of "Trash" Caught by Shrimp Trawlers in Florida. Proceedings of the Gulf and Caribbean Fisheries Institute, Fourth Annual Session, November 1951, pp. 94-99.
- SNOW, GEORGE W.  
1950. Development of Trash Fishery at New Bedford, Mass. Commercial Fisheries Review, vol. 12, no. 7 (July), pp. 8-10. (Also Separate No. 256.)
- SUTTKUS, ROYAL D.  
1955. Seasonal Movements and Growth of the Atlantic Croaker, Microgogon undulatus, Along the Louisiana East Coast. Proceedings of the Gulf and Caribbean Fisheries Institute, Seventh Annual Session, November 1954, pp. 151-158.
- VINCENT, DANIEL B.  
1951. Potentialities for Increased Utilization of Scrap Fish and Fish Waste in the Gulf and Caribbean Area. Proceedings of the Gulf and Caribbean Fisheries Institute, Third Annual Session, November 1950, pp. 52-55.





# COMPOSITION OF COMMERCIALY-IMPORTANT FISH FROM NEW ENGLAND WATERS

## Part I - Proximate Analyses of Cod, Haddock, Atlantic Ocean Perch, Butterfish, and Mackerel

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### INTRODUCTION

In recent communications, Stansby (1954) and Love (1957) pointed out the difficulties in interpreting data on the composition of fish and the need for more systematic studies in this field. The review by Love (1957) gives numerous references to published data on the protein, oil, ash, and moisture contents of fishery products. Examination of this literature reveals, however, that much of the data was obtained from the analyses of samples of unrecorded origin and that little information is supplied as to the size, sex, season, or area-of-catch of the samples analyzed. It is known that the composition of fish varies from species to species and often to an even greater extent from one individual fish to another of the same species (Bogucki and Trzesinski 1950; Ventkataraman and Chari 1951); yet few investigators have taken into account the factors that contribute to these variations.

Since proximate components vary within a wide range, an average value of a proximate component for any species has little meaning without the establishment of at least the approximate limits of the range of composition values. The correlation of ranges of value with the factors that determine the composition is also of importance.

Because information on composition is inadequate, we are engaged in a study to collect more representative data. Factors under consideration in our determinations of composition include species of fish, season, and geographic area where the fish were captured.

This report is concerned with the quantitative differences in the composition components that occur among species of fish taken from New England waters. Data also are presented on the ranges of composition that occur within certain species of fish and on the role that seasonal factors play in contributing to variability of composition. The protein, oil, ash, and moisture contents of the edible fillets and of the offal<sup>1</sup> of some commercially-important species of New England fish are reported. Subsequent reports will be issued as the study

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<sup>1</sup> Offal is the entire body of the fish minus the fillet. It includes head, bone, frame, skin, and viscera.



Fig. 1 - Kjeldahl determination of protein.

U. S. Bureau of Commercial Fisheries

progresses, making it possible to determine the degree of variation of the composition of fish of the same species taken in different years from the same geographic areas and during the same seasons.

### PROCEDURE

**SAMPLING TECHNIQUE:** The fish used in this study all were obtained from the "inshore" fishing fleet. Only fish in prime condition were selected; that is, they were well iced and were usually no more than 12 to 14 hours out of the water when analyzed. Samples were selected to give a composite of the commercially-landed catch. Representative samples of all sizes landed were selected. Samples were collected during a period of one year, and care was taken to insure that all samples of a given species were captured in the same general geographic area.

**CHEMICAL ANALYSES:** Nitrogen was determined by the Association of Official Agricultural Chemists Method (1950), and the factor 6.25 was used to calculate the protein content. Oil was determined by ether extraction in a Goldfish fat-extraction apparatus. Moisture was determined by oven drying at 110° C. to constant weight, and ash was determined by combustion in a muffle furnace at 550° C.

### RESULTS AND DISCUSSION

**VARIATIONS IN COMPOSITION AMONG DIFFERENT SPECIES OF FISH:** Table 1 presents values for the protein, oil, ash, and moisture content of the fillets of a number of species of New England fish. The ranges of values in the composition components are the ranges

Table 1 - Range of Composition Values of Edible Fillets of Some Species of New England Fish

Species	No. of Fish Analyzed	Protein		Oil		Ash		Moisture	
		Average	Range	Average	Range	Average	Range	Average	Range
(Percent)									
Cod ( <i>Gadus morhua</i> ) . . . . .	48	17.9	16.6-19.2	0.09	0.03-0.1	1.1	0.9-1.4	80.9	79.8-82.4
Haddock ( <i>Melanogrammus aeglefinus</i> ) . . . . .	42	18.8	15.5-20.2	0.17	0.05-1.3	1.2	0.9-1.6	79.7	78.2-82.1
Ocean perch ( <i>Sebastes marinus</i> ) . . . . .	72	17.9	15.3-19.4	1.1	0.2-4.1	1.1	0.9-1.8	79.3	75.9-84.4
Butterfish ( <i>Poronotus triacanthus</i> ) . . . . .	14	16.9	16.8-18.2	11.4	7.6-22.2	1.1	0.8-1.7	70.6	64.8-74.5
Mackerel ( <i>Scomber scombrus</i> ) . . . . .	26	17.3	13.9-19.4	21.0	10.4-28.7	1.3	0.8-2.2	60.0	53.7-68.4

that we have observed in our laboratory over a period of one year. All of the components of composition exhibit a range of values, but the component showing the greatest variability is oil. The species in table 1 may be arbitrarily divided into two groups according to their oil content. Cod, haddock, and ocean perch, which are species with oil content ranging from less than 0.1 to 4.1 percent, may be classified as lean fish whereas butterfish and mackerel, with oil contents ranging from 7.6 to 28.7 percent, may be classified as oily fish. Moisture and protein also exhibit variation among species. On an absolute basis, ash content is rather constant, varying only between 0.8 and 2.2 percent. On a percentage basis, however, this variation is very large.

**VARIATIONS IN COMPOSITION AMONG FISH OF THE SAME SPECIES:** Table 2 presents data on the variation in composition of mackerel fillets. Samples 1 to 6, which were landed during the month of October, show a narrow range of values for any one component; whereas 7 through 12, which were landed during the month of November, show a generally wide range of values. The oil and moisture components exhibit the greatest variation, whereas the protein component exhibits little variation. The mackerel are pelagic fish, and the variation in the fat component may be influenced by the migratory habits of this species (Stansby and Lemon 1941). These data indicate the wide range of values with re-

Table 2 - Composition of Edible Fillets of Mackerel (*Scomber scombrus*) Caught During Fall of Year

Date Captured	Fish No.	Fillet Composition			
		Protein	Oil	Ash	Moisture
(Percent)					
October	1	17.9	23.0	1.7	57.1
	2	17.8	23.8	1.6	56.2
	3	18.5	22.3	1.2	57.3
	4	18.3	22.7	1.4	57.5
	5	18.3	22.5	1.1	57.4
	6	17.7	24.2	1.3	56.8
November	7	19.4	10.4	1.8	68.4
	8	18.8	11.6	1.8	67.7
	9	18.5	14.0	1.9	65.8
	10	19.1	14.6	2.0	64.2
	11	18.3	18.8	2.4	60.5
	12	18.2	20.3	2.2	59.4

Table 3 - Proximate Composition of Filets and Offal of Cod (*Gadus morhua*)

Season Captured	No. of Samples	Filet Composition				Offal Composition			
		Protein (**)	Oil (**)	Ash (**)	Moisture (**)	Protein (**)	Oil (**)	Ash (**)	Moisture (**)
		Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range
Spring . . . . .	24	16.6-19.2	.09-1.03-0.2	1.2-1.0-1.4	81.4-79.8-82.4	16.1-15.0-17.5	0.7-1.0-3.2-2.2	4.4-3.0-5.6-6.6	78.3-76.2-79.8
Summer . . . . .	12	17.4-16.6-18.4	.11-0.03-0.2	1.0-0.9-1.1	81.5-80.4-82.4	1/3	1/3	1/3	1/3
Fall . . . . .	18.1	17.8-18.4	.08-.06-.11	1.0-0.9-1.1	80.9-80.1-81.0	15.9	14.3-16.7	4.3-3.4-4.8	3.4-2.9-4.4
Winter . . . . .	12	16.3-18.7	0.05-.03-.07	1.1-1.1-1.3	80.9-80.4-82.1	16.8	15.6-16.1	0.3-0.6	3.6-3.4-6.9
									78.5-77.3-80.5

(Percent)

\*\*Variation related to the season at the 5-percent level of significance.

1/ These cod were received in the "gutted" condition.

Table 4 - Proximate Composition of Filets and Offal of Ocean Perch (*Sebastes marinus*)

Season Captured	No. of Samples	Filet Composition				Offal Composition				
		Protein (**)	Oil (**)	Ash (**)	Moisture (**)	Protein (**)	Oil (**)	Ash (-)	Moisture (**)	
		Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	
Spring . . . . .	36	18.1-17.0-19.4	1.4-1.0-2.4-1	1.1-1.0-1.8	79.3-75.9-82.0	16.2-14.9-17.9	8.5-11.0-12.9	6.7-4.8-9.3	68.3-62.8-78.4	
Summer . . . . .	12	18.1	17.3-18.5	1.1-1.0-3-1.9	1/1	78.8-77.4-80.4	15.9	15.0-17.9	4.0-2-3-7-2	
Fall . . . . .	24	17.6	15.3-19.0	0.6-0.2-1.1	1.1	1.0-1.7	80.3-78.4-84.4	16.1	15.1-17.2	6.4-4.8-8.0
Winter . . . . .	12	18.1	17.3-19.1	1.3-1.0-4-2.8	1.1	0.9-1.4	78.9-76.8-80.8	17.0	16.0-19.0	8.4-5.7-11.5
									6.7-6.0-8.3	

(Percent)

\*\*Variation related to the season at the 5-percent level of significance.

1/ Sample was lost.

(-) Variation is not related to the season.

(\*\*\*) Variation related to the season at the 1-percent level of significance.

Table 5 - Proximate Composition of Filets<sup>1/</sup> and Offal of Mackeral (*Scomber scombus*)

Season Captured	No. of Samples	Filet Composition				Offal Composition			
		Protein (**)	Oil (**)	Ash (**)	Moisture (**)	Protein (**)	Oil (**)	Ash (-)	Moisture (**)
		Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range	Av.   Range
June . . . . .	6	15.1	13.9-16.2	21.5-18.6-23.5	1.0-0.8-1.1	61.9-60.3-64.0	13.3	12.9-13.6	18.1-17.2-19.2
October . . . . .	6	18.1	16.4-18.5	23.1-19.3-28.7	1.4-0.9-1.7	57.0-56.2-57.5	15.0	14.2-16.2	19.4-16.0-20.2
November . . . . .	6	18.7	18.2-19.4	14.9-10.4-20.3	2.0-1.1-2.2	64.3-59.4-68.4	15.7	14.1-16.4	15.5-13.5-17.4
									3.1-3.1-4.4

(Percent)

1/ These filets were analyzed with the skins on, since this is the way they usually are prepared.

(-) Variation is not related to the season.

(\*) Variation related to the season at the 5-percent level of significance.

(\*\*) Variation related to the season at the 1-percent level of significance.

spect to some components that may occur in fish of the same species captured during different times of the same season.

**VARIATIONS IN COMPOSITION OF FISH HARVESTED DURING DIFFERENT SEASONS OF THE YEAR:** The seasonal variation in the composition components of cod, ocean perch, and mackerel are shown in tables 3, 4, and 5. Analyses of variance (F-test<sup>2</sup>) was used to determine if there were statistically-significant differences in the protein, oil, ash, and moisture contents of the fillets, and of the offal owing to the season in which the fish were caught. In the case of cod (table 3), all of these components were found to be statistically significant at the 5-percent level for season.

Table 4 indicates that seasonal variations of all the proximate components of the fillets and offal of ocean perch, except for ash of the offal, are statistically significant at the 1-percent level. No significant relation was found between the variation of the ash content of the offal and the season.

The data for mackerel are not extensive enough to permit analysis for variation due to season. They have been examined to determine the relation between variation in composition and the 3 months for which data were collected. Table 5 indicates that monthly variations of protein, ash, and moisture contents of mackerel fillets are statistically significant at a level greater than 1-percent. The variation in oil values of the fillets is related to the month at the 1-percent level of significance. The monthly variations for protein, oil, and moisture of mackerel offal are related to the month at a level greater than 1 percent. There is no significant relationship between variation in the ash content of the offal and the time of the year.

#### SUMMARY

The protein, oil, and moisture contents of cod, haddock, Atlantic ocean perch, butterfish, and mackerel were determined.

Application of the F-test for analyses of variance indicated that in almost all cases, the variation in proximate components that exists within a species is related to the time of the year. The degree of significance of this relationship is greater for ocean perch and mackerel than it is for cod.

<sup>2</sup>The F-test is a statistical test permitting the evaluation of real, existing, and/or nonexistent differences between and among variables.

Note: The authors gratefully acknowledge the contribution of Mrs. Sue Nealis, Statistical Assistant, U. S. Bureau of Commercial Fisheries Technological Laboratory, College Park, Md., in performing the analyses of variance.

#### LITERATURE CITED

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|---|---|
| <p>ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS<br/>1950. <u>Official Methods of Analysis</u>. Seventh Edition, p. 13, Washington, D. C.</p> <p>BOGUCKI, M. and TRZESINSKI, P.<br/>1950. Fluctuations in the Content of Water and Fat in Cod. <u>Biuletyn Instytutu Medycyny Morskiej i Tropikalnej</u>, vol. 5, no. 25, Gdansk, Poland.</p> <p>LOVE, R. M.<br/>1957. <u>The Physiology of Fishes</u>. vol. 1, chap. 10, Ed. Margaret E. Brown, Academic Press Inc., New York, N. Y.</p> | <p>STANSBY, M. E. and LEMON, J. M.<br/>1941. Studies on the Handling of Fresh Mackerel (<u>Scomber scombrus</u>). <u>Research Report No. 1</u>, U. S. Bureau of Commercial Fisheries, Washington, D. C., 46 pp.</p> <p>STANSBY, M. E.<br/>1954. Composition of Certain Species of Fresh Water Fish. 1. Introduction: The Determination of the Variation of Composition of Fish. <u>Food Research</u>, vol. 19, no. 2, pp. 231-234.</p> <p>VENTKATARAMAN, R. and CHARJ, S. L.<br/>1951. Seasonal Variation in the Chemical Composition of Cod. <u>Proceedings of the Indian Academy of Science</u>, vol. 33, sec. B., pp. 126-129.</p> |
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# TRENDS AND DEVELOPMENTS

## Alaska

### COMMERCIAL FISHERY REGULATIONS FOR 1961 SEASON:

After a 10-day session, acting upon a wide range of proposals for the 1961 Alaska fish and game regulations, the Chairman of Alaska's 8-man Board of Fish and Game adjourned on December 7, 1960.

Proposals for the Board's consideration and action had been made by the staff of the Alaska Department of Fish and Game, members of the Board, Advisory Committees, and the general public. The proposals adopted by the Board will be incorporated into the 1961 regulations for Alaska's sport fish, game, and commercial fisheries. All three are issued separately.

The commercial fishery regulations were expected to be ready for distribution sometime in March 1961. The regulations will provide the rules under which several hundred million pounds of fishery resources can be harvested along a vast segment of the Alaskan Coast extending north through Southeastern Alaska, Yakutat, Prince William Sound, Cook Inlet, Kodiak, Alaska Peninsula, the Aleutian Islands, Bristol Bay, and the Yukon and Kuskokwim Rivers.

The Board approved a regulation which specifies that all subsistence fishing in Southeast Alaska be done under authority of a permit issued by the Department of Fish and Game.

The Board approved a regulation which specifies that king crabs may be taken in Southeast Alaska by pots only. The use of otter trawls with a ground line or head line less than 60 feet in length may be used to take king crab-pot bait.

Of considerable interest throughout Southeast Alaska was the opening date for the purse-seine fishery. The Board agreed to carry over the 1960 regulations to 1961. Accordingly, the Icy Strait, Eastern, and Western Districts will open on June 26, and the other districts will open as specified in the 1960 regulations.

All Southeast gill-net areas will remain the same in 1961 as in 1960, except for a minor change in the Portland Canal area where the line from Tree Point has been changed so that it extends in a true south direction to the International Boundary.

All salmon net fishing in the Yakutat Area shall be closed by field announcement. This is a change from the 1960 regulations in which all fishing was closed by dates specified in the regulations.

The Alek River will open to fishing on May 15 instead of June 1.

The taking of herring spawn for commercial purposes in waters adjacent to Fish Egg, Clam, and Alberto Islands was approved by the Board. The combined weight of eggs and kelp shall not exceed 50 short tons.

Regulation changes in Prince William Sound do not provide for a purse-seine season in 1961, however, the door is left open to harvest the runs if they do develop.

Changes also provide for a drift and set gill-net fishery in the Eshamy district and a drift gill-net fishery of the newly-created Coghill district of Prince William Sound.

The Board also included in the 1961 regulations provisions for control of the king crab fishery that has recently developed in Prince William Sound. New regulations provide for king crab registration in Area E, a 35-spot limit, and trawling limited to a 60-foot ground line for bait only.

Other changes give the Department field staff the flexible control for better management of the salmon runs. Prominent of these was the change to divide Prince William Sound into eight management districts.

The 1961 salmon season for Kodiak will extend from June 1 to September 30 with weekly fishing periods of three days during July and parts of June and August in some districts. A five-day period will be in effect the remainder of the season.

Troll fishing will be permitted in the Kodiak area in 1961.



Above: Male king crab with triangular-shaped abdomen; below: female with broad fan-shaped abdomen.

a maximum of 60 feet in length.

Set netting will be permitted by only those persons who have resided in the Kodiak fishing area for one year immediately prior to the date of fishing.

Beach seines 225 fathoms in length will be permitted in the area.

King crab fishermen must place the Alaska Department of Fish and Game vessel number on the upper half of each king crab pot buoy in numerals at least 3 inches high and  $\frac{1}{2}$  inch in width. Otter trawls for king crab may have ground and lead lines

All waters in the immediate Kodiak vicinity that are closed to sport fishing for salmon during the pink spawning period will be closed to subsistence fishing. The

Kodiak channel from the Small Boat Harbor to Spruce Cape will be closed to commercial and subsistence fishing.

The Cook Inlet king salmon season will open, in the area north of Anchor Point, on June 8, with no mesh size requirement. The remaining districts in the area will be opened by field announcement.

During the 1961 season there will be no gear time table in effect in the upper Inlet.

Subsistence fishing regulations in Cook Inlet remain basically the same with the exception that no subsistence fishing will be allowed in the Susitna River.

Regulations for the 1961 commercial fishing season on the Alaska Peninsula, Chignik, and Aleutian Islands areas adopted by the Alaska Board of Fish and Game include major changes from the 1960 regulations: the opening of the area northeast of Port Heiden on July 17; the opening of Ilnik Lagoon to a gill-net fishery on May 1; the closure of a section between the Three Hills and Cape Seniavin; the opening of a section from the Black Hills to Moffet Point; the exclusion of drift nets between Kenmore Head and Kupreanof Point; the limitation to pots only for king crab fishing in State waters between Cape Pankof and Kilokak Rocks; the reduction of minimum distances between set nets to 900 feet (Nelson Lagoon excepted) and between a set net and a purse seine to 500 feet; exclusion of set nets in the Chignik area only; and a uniform June 12 opening throughout the Chignik area.

There are no changes from the 1960 regulations for the Aleutian Islands area.

Two changes of importance relating to the Bristol Bay area were adopted by the Board. The gear time table was revised downward in the Nushagak district from 225 to 200 units for 2½ days fishing per week, while in the remaining districts the level of effort for 2½ days fishing per week was raised as follows: Naknek-Kivchak, from 275 to 334 units; Egegik, from 60 to 68 units; Ugashik, from 35 to 43 units.

In the second major Bristol Bay action, the Board effectively served notice that its regulations on mesh size would be strictly enforced. A reduction in minimum size during the main part of the season from 5½" to 5" was approved for the 1961 season only with the provision that the 5½" size be reinstated the following year.

A small portion of the Nushagak district known as the Snake River Section was also closed for the coming year.

In general, the regulations for commercial fishing in the Arctic-Yukon-Kuskokwim areas means the elimination of the quota system, substituting for it a flexible system of openings and closures at the mouths of both the Yukon and Kuskokwim. Above Marshall on the Yukon and Akiachak on the Kuskokwim Rivers small quotas on king and silver salmon are in effect. Below those points commercial fishing would be limited to king salmon only prior to August 1.

Subsistence fishing is regulated only in the areas of commercial fishing, below Marshall on the Yukon and Akiachak on the Kuskokwim, and in those spots is subject to the opening and closing regulations of the commer-

cial fishery. Outside of those two areas there is practically no regulation of subsistence fishing.

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### MESH-SIZE REGULATIONS REVISED FOR NETS NOW IN USE:

The Alaska Board of Fish and Game in December 1960 reviewed two instances where mesh-size requirements for nets were considerably larger than many in present use. Although both of the regulations have been in effect many years, nets were purchased near to the minimum size and through shrinkage have become illegal.

The Board, through two regulations recently passed, effectively served notice that a reasonable period of time would be given to utilize the fishermen's present mesh so that no economic hardship will result, but that at a set future date nets must be in use, which after shrinkage, will conform to the legal mesh-size requirement.

Regulation 102.11 (b) now reads: "Where the use of leads is permitted, a purse-seine boat may have or use not more than one lead of legal length and depth, without purse rings attached, and with mesh at least 6 inches stretched measure, except that in 1963 the minimum mesh size requirement shall be 7 inches." This regulation is in the general section and refers to all purse-seine leads in Alaska.

In Bristol Bay under Section 104.12 the minimum mesh size for 1961 was changed to 5½ inches. The regulation now reads: "(1) In all districts, stretched measure shall be not less than 5½ inches during 1961; provided: (A) That stretched measure shall be not less than 4½ inches after July 16 and (B) That stretched measure shall be not less than 5½ inches during the 1962 season prior to July 16.

A new mesh-size regulation for purse seines in Prince William Sound was passed with provisions to utilize the present seines of larger mesh until 1963. Section 111.15 calls for mesh in the seine not greater than 4 inches stretched measure. If some present seines are of larger mesh, a permit may be obtained to utilize the old seines during 1961, 1962, and 1963.



## Byproducts

### A STUDY OF TRANSPORTATION OF FISH MEAL, SCRAP, AND SOLUBLES:

A study of transportation of fish meal, fish scrap, and fish solubles is being made by the Transportation and Public Utilities Service, U. S. General Services Administration, under a contract assigned to that agency by the U. S. Bureau of Commercial Fisheries. The study will be concerned mainly with the analysis and evaluation of railroad freight rates and services for the products from production points to various destinations.

The level of rates for competitive products will be studied, and analyses made of tariff structures, transportation characteristics, classification descriptions, exceptions to the classification, domestic versus import rates, motor versus rail rates, contract and private carriage, barge competition, and costs of delivery to the railhead. Included will be a review of services provided, such as switching and supply of cars.

Rates for fishery byproducts have evolved through a hit or miss process. In some territories they are categorized with grain in the grain tariffs. In others they are treated as fertilizer. In one territory no commodity rates have been established. Therefore, class rates and exceptions to the class rates are used. This situation complicates ascertaining rates and usually requires the use of a combination of rates rather than a through rate. With the change in predominant use of fish meal from fertilizer to a feed ingredient, its movement has changed but the rates have not changed.

The study will be useful to the many domestic fish-meal producers located along the Atlantic, Gulf, and Pacific coasts. It will enable producers to concentrate their sales effort on the most advantageous inland markets. Fish meal and scrap are used as a growth ingredient by poultry feed mixers. The mixers are located in many of the non-coastal states.

Transportation cost is an important part of total cost to the user amounting to 20 percent or more in many instances. Therefore, any reduction in transportation cost through better routing and selection of size of movement will be important to the producer, mixer, and consumer. The information will be useful for negotiations with carriers as an aid for improving rates where traffic has not been moving because of unrealistic rates.



## California

### ARTIFICIAL SALMON SPAWNING CHANNEL EXPERIMENT:

The results of California's first experiment with an artificial king salmon spawning channel are being watched closely by the State's Department of Fish and Game and the East Bay Municipal Utility District.

The Utility District agreed to build a channel or a hatchery downstream from the natural spawning areas

on the Mokelumne River which will be wiped out by the District's Comanche Dam to be completed in 1964. The spawning channel is less expensive than a hatchery and the present experiment is designed to see whether a channel can produce salmon more efficiently than a hatchery.

The channel is about 3½ miles below Pardee Dam near the ghost town of Lancha Plana, near the Amador-Calaveras County line. The spawning area parallels the Mokelumne River. It is 200 feet long and 20 feet wide. Suitable spawning gravels form the bed of the channel. The first ripe fish placed in the channel began their spawning activities immediately; but the State fisheries managers are not yet ready to term the experiment a success. The ultimate fish hatch will determine that.

The spawning area, first experiment of its kind in the State, was built at a cost of over \$23,000. A screen was installed at the downstream end of the channel to catch the fry so they may be counted before they begin their migration to the sea. Gates at the upstream end regulate the level and rate of flow of the water.

\* \* \* \* \*

### CRAB STUDIES CONDUCTED IN COASTAL WATERS:

M/V "Nautilus" Cruise 60-N-9-Crab: Crab fishing was conducted (Sept. 16-Oct. 6 and Oct. 15-31, 1960) by the California Department of Fish and Game research vessel Nautilus in California coastal waters from Half Moon Bay to the Russian River to obtain information on (1) a standard procedure for random sampling of crabs by commercial traps; (2) catch per unit effort for studies of recruitment as related to spawning stock; (3) age and growth for age determination studies; and (4) basic life history of the Dungeness crab.

A total of 30 40-inch commercial-type crab traps, without escape ports, were fished in depths of 9-35 fathoms in 129 randomly-selected settings of five traps each. Squid was used for bait.

A standard procedure for random sampling was followed. Blocks (one by two miles) and subblocks of the area surveyed, were selected randomly. Two subblocks (one-half mile square) were sampled in each block selected. The traps were emptied, rebaited, and set in new locations each day. The average fishing time per trap was 21 hours. The validity of this procedure and the actual adequacy of the samples are to be analyzed.

The catch per unit of effort of legal male crabs (width greater than 158 mm., excluding the most lateral spines), sublegal males, and females, was determined. The data on size and sex of crabs caught will be used in studies of the relationship of recruits to spawning stock.

The shoulder width of all crabs caught was recorded. These width frequencies are of great value in age studies. Widths of crabs caught ranged from 85 to 218 mm. for males and 103 to 180 mm. for females.

Nine females with orange egg masses were caught. These crabs had shoulder widths ranging from 112-154 mm.







## SHRIMP STUDY OFF CALIFORNIA COAST CONTINUED:

M/V "N. B. Scofield" Cruise 60-S-5-Shrimp: The coastal waters off southern, central, and northern California were surveyed (Sept. 16-Oct. 30, 1960) by the California Department of Fish and Game research vessel N. B. Scofield. Objectives were (1) to conduct exploratory fishing operations for pink shrimp (*Pandalus jordani*); (2) to determine size, sexes, and weight of shrimp from different areas; (3) to obtain bottom temperatures in shrimp fishing areas; and (4) to identify, measure, and weigh incidental fish catches.

**EXPLORATORY OPERATIONS:** A total of 168 tows was made with a 20x8-ft. beam trawl having a nylon net of 1½-inch mesh. These tows included 47 from the Oregon-California border to False Cape; 36 from Big Flat to Pt. Arena; 28 from just south of Pt. Arena to the Russian River; and 57 from San Simeon to Santa Cruz Island.

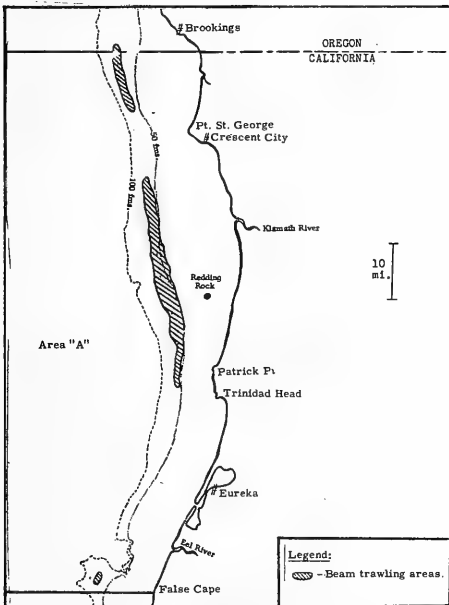


Fig. 1 - M/V N. B. Scofield Cruise 60-S-5-Shrimp.

The best shrimp catches in the northern area were made off Patrick Pt. in 50-55 fathoms, and west of Redding Rock in 54 fathoms. Tows in these areas produced catches at the rate of 1,650 and 1,080 pounds of heads-on shrimp per hour, respectively. Operations from the Oregon border to Pt. St. George produced shrimp at the rate of 275 pounds per hour in 58 to 68 fathoms. Although shrimp were taken in 44 of 45 tows between the Oregon border and Trinidad Head, only in 18 tows were they taken at a rate greater than 200 pounds per hour. No shrimp were caught in two tows south of the Eel River near False Cape, but one

tow produced 232 (approximately 464 pounds) Dungeness crabs (*Cancer magister*). These were taken at a depth of 75 fathoms and all were soft.

Operations revealed a large and heavily concentrated school of shrimp in the Usal-Cape Vizcaino area. This school was approximately 13 miles long and 2.5 miles wide, and was in 55 to 75 fathoms of water. Fifteen tows made along the entire length and width of the school, yielded an average catch of 1,598 pounds per hour. The most productive tow took shrimp at the rate of 3,000 pounds per hour. Seven tows in the Big Flat area were not as productive. The best tow caught shrimp at the rate of 330 pounds per hour in 55 fathoms.

Shrimp appeared to be thinned out in the Westport area. This area, which had good commercial shrimp fishing in August 1960, had a catch rate of less than 210 pounds per hour. Five tows off the Navarro River, in 51-64 fathoms, produced only a few shrimp of the year--12 individuals about 6 months old were captured in one tow.

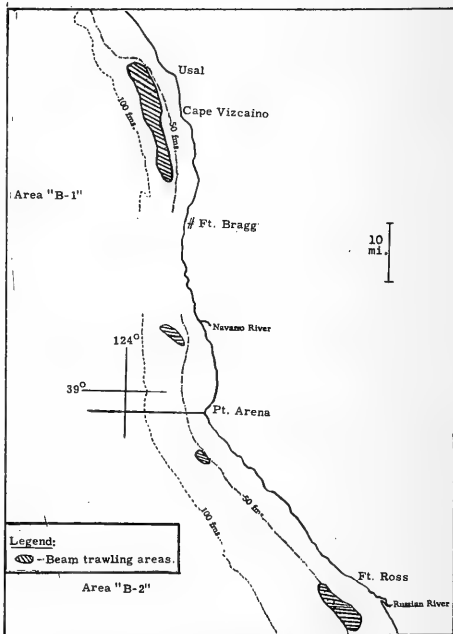


Fig. 2 - M/V N. B. Scofield Cruise 60-S-5-Shrimp.

A small shrimp school was located off Ft. Ross in 49 to 52 fathoms. The school was approximately 5 miles long and 1.5 miles wide. Five tows yielded an average catch of 622 pounds per hour. The most productive catch was at the rate of 1,000 pounds per hour. Shrimp were not found in commercial quantity off the Russian River in 40-47 fathoms. This is where shrimp were found in April 1960. Tows off Saunder's reef in 51 to 54 fathoms did not yield shrimp.

Tows were made off San Simeon, Estero Pt., Avila, and Pt. Sal. The most successful were off San Simeon and Estero Pt., and produced catches per hour of 172 and 174 pounds, respectively. Depths in these areas were 122 and 115 fathoms. The heaviest concentration was found 9 miles southwest of Avila in 110 to 120 fathoms. Three tows yielded an average of 910 pounds per hour. The best catch was at the rate of 1,650 pounds per hour. Heavy seas prevented further exploration. The fishery existed at this locality in 1952 and 1953, but since then landings have declined and few shrimp were found there by the commercial fleet.

One tow, 15 miles southwest of Pt. Sal, in 126 fathoms, produced a catch of 570 pounds per hour. This was the general locality where three commercial vessels landed 75,000 pounds last season. In addition,

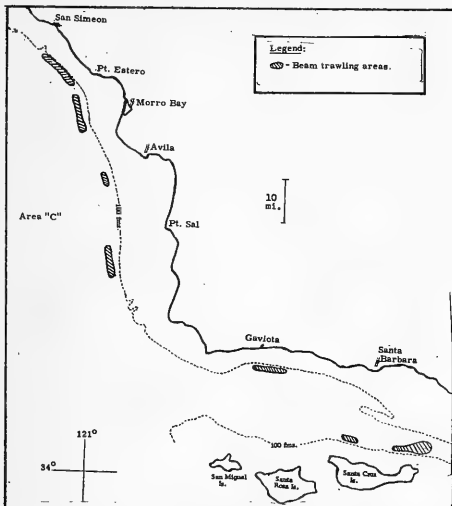


Fig. 3 - M/V N. B. Scofield 00-5-S-Shrimp.

six tows were made off Gaviota and 23 were made off the channel side of Santa Cruz Island. Although not in commercial concentration in those localities, shrimp were taken in every tow off Gaviota and in 14 of the 23 tows off Santa Cruz Island. The best tow off Gaviota (in 120 fathoms) produced 69 pounds per hour. The most productive tow off Santa Cruz Island was in 127 fathoms and yielded 75 pounds per hour.

#### SIZE, SEX, WEIGHT AND COUNT OF SHRIMP:

Samples of shrimp were obtained in all areas and in 130 of the 168 tows. Approximately 50 individuals from each of the samples were sexed, measured, and weighed. Many of the female shrimp contained head roe and a few were carrying spawn. Most of the 1½-year old females had head roe and would become first-year spawners during the winter. These shrimp had made the transition from male to female last summer.

**BOTTOM TEMPERATURES:** A total of 131 bathythermograph casts was made and bottom temperatures were obtained in all areas where shrimp were found.

**INCIDENTAL FISH CATCHES:** Incidental fish catches were light in all areas. Counts and average weight of all species from 163 tows were recorded. Unmarketable species such as slender sole, *Lyopsetta exilis*, hake, *Merluccius productus*, and juvenile rockfish, *Sebastes saxicola*, were the principal species.

Note: Also see *Commercial Fisheries Review*, August 1960 p. 17.

## Cans--Shipments for Fishery Products, January-October 1960

Total shipments of metal cans during January-October 1960 amounted to 107,844 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 101,537 tons in the same period of 1959. As of the end of October, the pack of California sardines continued to fall behind the poor pack of 1959. However, total packs for salmon and Maine sardines were up from 1959 and the tuna pack will be equal to or exceed the very good 1959 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.



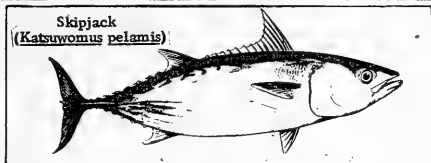
## Central Pacific Fishery Investigations

### SKIPJACK TUNA BLOOD SAMPLES AID IN DISTRIBUTION STUDIES:

M/V "Charles H. Gilbert" Cruise 50: The Honolulu-based fisheries research vessel Charles H. Gilbert, of the U. S. Bureau of Commercial Fisheries, returned December 10, 1960, to Kewalo Basin from a two-months cruise in South Pacific waters. This voyage (Cruise 50) took scientists headed by a geneticist to Fanning and Christmas Islands in the Line group, to Tahiti, and then to the atoll of Rangiroa in the Tuamotu Archipelago, and to most of the major islands of the Marquesas. The crew caught bait fish at many of the islands for fishing skipjack tuna (aku), to provide material for the scientists' studies.

One of the major research objectives, as explained by the geneticist, was to compare the blood types of the skipjack tuna taken in each of the areas visited in order to determine whether the fish around each of the major island groups

of the Central Pacific are interrelated or form separate local populations. The skipjack, which supports Hawaii's largest commercial fishery, is strongly seasonal in nature, indicating that the fish are migratory. Tuna ex-



perts believe that the species may exist in such great numbers in the ocean as a whole as to provide the basis for a much greater commercial catch than is produced at present. In order to determine what these potentialities may be, and how best to go about developing them, the necessary first step is to learn whether the skipjack of the Central Pacific belong to only a few large, wide-ranging populations or whether they form a large number of separate stocks. According to the geneticist, the results of his work on this cruise indicate little relationship between the skipjack of Hawaiian waters and those found around the South Pacific archipelagoes. The blood studies further showed that the skipjack of Marquesan and Tuamotuan waters are of strongly differing types.

Other scientific work done during the cruise by fishery biologists included the collection of the very small larval and juvenile stages of tuna by means of special trawl nets towed below the surface. Observations and moving picture records of the behavior of skipjack were made through the windows in the unique underwater observation chambers in the stern and bow of the vessel. The reactions of the tuna to sounds produced by porpoise and squid were recorded and will be studied in comparison with similar behavior records taken in Hawaiian waters.

Skipjack were found in good numbers in the Marquesas and Tuamotu areas, where they were fished with good success. Schools also appeared numerous in Tahitian waters, but the skipjack there were moving fast and erratically and did not respond well to bait.



## Dams

### INADEQUATE FISH PASSAGE FACILITIES AT OXBOW AND BROWNLEE DAMS CAUSE CONCERN:

The problem of maintaining the salmon and steelhead runs at Oxbow and Brownlee Dams has reached a very critical point, particularly because of the apparent ineffectiveness of the downstream migrant facilities at Brownlee Dam consisting of a large net barrier in the reservoir and associated "skimmers."

The U. S. Department of the Interior in its letter of September 3, 1960, to the Federal Power Commission pointed to the critical nature of the problem and requested issuance of an order for appraisal studies and supplementary facilities for artificial propagation. The whole complex of problems in connection with these projects is receiving a great deal of attention from both the Federal and State fisheries agencies.

On September 16, 1960, the Idaho Power Company in a motion to the Federal Power Commission, requested that the hearing on the matter of fish facilities requirements at Oxbow and Brownlee Dams on the Snake River be reopened and that an order be issued by the Federal Power Commission to the Company providing for:

- (a) A stay in the Commission's order of February 12, 1958, which requires construction and operation of permanent-type fish facilities at Oxbow Dam;
- (b) A temporary arrangement for handling the upstream migrants at Oxbow Dam;
- (c) The development of a study program, to be financed by the Company, to appraise the effectiveness of the Brownlee and Oxbow Dam facilities;
- (d) The provision of supplementary facilities for the artificial propagation of the spawn from about 2,000 adult salmon below Oxbow Dam.



## Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES,  
JANUARY-NOVEMBER 1960:

Frozen Fishery Products: For the use of the Armed Forces under the Department

of Defense, 1.7 million pounds (value \$898,000) of fresh and frozen fishery products were purchased in November 1960 by the Military Subsistence Supply Agency. This was less than the quantity purchased in October by 2.4 percent, but was 19.4 percent more than the amount purchased in November 1959. The value of the purchases in November 1960 was lower by 2.5 percent as compared with October, but was up 25.9 percent from November 1959.

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

QUANTITY				VALUE			
November		Jan.-Nov.		November		Jan.-Nov.	
1960	1959	1960	1959	1960	1959	1960	1959
..... (1,000 Lbs.)				..... (\$1,000)			
1,723	1,443	21,211	20,876	893	713	11,007	10,748

During the first 11 months of 1960 purchases totaled 21.2 million pounds (valued at \$11.0 million)--an increase of 1.6 percent in quantity and 2.4 percent in value as compared with the same period in 1959.

Prices paid for fresh and frozen fishery products by the Department of Defense in November 1960 averaged 52.1 cents a pound, about 0.1 cent less than the 52.2 cents paid in October, but 2.7 cents more than the 49.4 cents paid during November 1959 when supplies were more plentiful.

**Canned Fishery Products:** Tuna was the principal canned fishery product purchased for the use of the Armed Forces during November 1960. In the first 11 months of 1960, purchases of canned tuna were up about 20.5 percent and canned salmon were up 231.2

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

Product	QUANTITY				VALUE			
	November		Jan.-Nov.		November		Jan.-Nov.	
	1960	1959	1960	1959	1960	1959	1960	1959
..... (1,000 Lbs.)								
Tuna	422	355	3,563	2,957	196	154	1,589	1,357
Salmon	-	414	3,593	1,085	-	267	2,436	737
Sardine	2	1	126	1,026	1	1	52	166

percent as compared with the same period in 1959. However, purchases of canned sardines in January-November 1960 were down about 87.7 percent, as compared to 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.



## Florida

### MIAMI UNIVERSITY MARINE LABORATORY RECEIVES GRANT FOR STUDIES OF MARINE LIFE:

A grant totaling \$263,984 has been made to the Marine Laboratory of the University of Miami by the National Heart Institutes of the U. S. Department of Health, Education and Welfare Public Health Service. The grant is to finance a five-year program of post-doctoral fellowships for biologists trained in inland institutions, but who wish to enlarge their experience through experimental studies of marine life.

According to the Director of the Laboratory, the investigation of marine animals is not only important from the point of view of marine biology but has also, in the past, contributed considerably to sciences basic to medical knowledge, such as embryology, physiology, and biochemistry. For this reason the new Marine Laboratory program has been designed to provide research facilities for scientists whose training and experience has been in medical and other branches of biology rather than in marine biology.

Each year during the five-year program as many as six biologists will be selected and will work at the Marine Laboratory for a period of one year. This activity will be under the general supervision of a member of the Marine Laboratory staff of scientists, aided by an advisory committee comprising a professor of biochemistry and a professor of physiology, both of the University of Miami School of Medicine.

The program will involve formal courses to familiarize the participants with the flora and fauna of the local marine areas. Following this, they will be encouraged to carry on their own researches under the supervision of one of the senior staff of scientists at the Marine Laboratory, or they may take a part in research programs already under way.



## Great Lakes Fishery Investigations

### LAKE MICHIGAN FISH POPULATION SURVEY ENDS FOR SEASON:

M/V "Cisno" Cruise 11: The fish population survey in Lake Michigan was continued during the November 22-25, 1960, cruise--

the last of the season--by the U. S. Bureau of Commercial Fisheries research vessel Cisco. All work was conducted off Grand Haven, Mich. Immediately after the cruise, the Cisco was sent to winter dockage at Bay City, Mich.

A 52-foot balloon trawl of the type used by Lake Michigan commercial fishermen was towed at 5-fathom-depth intervals from 10 to 40 fathoms. The best chub catches were only moderately large, but alewife catches were the largest of the season. Had the cod end of the trawl been made of smaller mesh, some of the alewife catches might have been much greater. On some occasions, many small alewives were seen escaping through the cod end when the net was brought in.

Concerning the vertical distribution of major species, the greatest catch of chubs was taken at 25 fathoms, although some were taken at all depths; alewives were present also at all depths but were most abundant at 10-15 fathoms; yellow perch were most numerous at 15 fathoms with virtually none taken at other depths. Small numbers of slimy sculpins, deep-water sculpins, smelt, and spot-tail shiners were also taken in the trawl. A single 19-inch whitefish was caught at 10 fathoms.

Gangs of nylon gill nets (50 feet each of  $1\frac{1}{4}$ - and  $1\frac{1}{2}$ -, 100 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 at 25 and 50 fathoms. The catch at 25 fathoms was 578 Leucichthys hovi, 3 L. reighardi, 1 L. kivi, 5 lake herring, 96 alewives, 22 smelt, and 7 yellow perch; at 50 fathoms the nets took 420 L. hovi, 14 L. kivi, 3 L. zenithicus, 3 lake herring, and 7 fourhorn sculpins. Most of the L. kivi were ripe, but none had spawned.

Hydrographic observations and collections were made at the regular 25-fathom station off Grand Haven. Surface-water temperatures in the open lake averaged about 46.5° F. Vertically homothermous conditions prevailed to a depth of 35 fathoms.

Note: Also see Commercial Fisheries Review, Jan. 1961 p. 25.

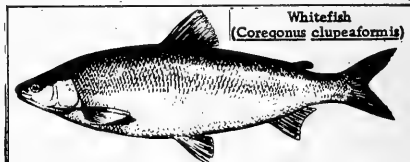
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#### WESTERN LAKE SUPERIOR WHITEFISH SPAWNING SURVEY:

M/V "Siscowet" Cruise 9: The annual assessment of whitefish spawning activities in the Apostle Island region of Lake Superior

was conducted (November 14-25, 1960) by the U. S. Bureau of Commercial Fisheries research vessel Siscowet. Large-mesh gill nets (4- to 6-inch mesh stretched measure) were set on four spawning reefs: Outer Island Shoal, Rocky Island Shoal, South Twin Island Shoal, and Cat Island Shoal. At each location except Cat Island, short gangs of nets were set just offshore, with the skiff in water 3 to 10 feet deep. Trawl tows were made with the Siscowet in waters adjacent to South Twin Island and Cat Island. In addition to the whitefish assessment studies, standard gangs of experimental gill nets (1- to 5-inch mesh by  $\frac{1}{2}$ -inch intervals) were set south of Stockton Island.

Eighty-seven out of 105 spawning whitefish caught by gill nets in the Apostle Island area were tagged and released at the place of capture. Nearly all of the whitefish were males (only 10 females). All males were ripe but it was not until the end of the cruise that all of the females were ripe. No spent fish were observed. The average length of the white-



fish was only 18.3 inches (about 2.0 pounds). The smallest mature whitefish was a 15.3-inch male and the largest was a 23.1-inch male. The females averaged larger (20.2 inches) than the males (18.1 inches). The occurrence of small whitefish on the spawning grounds is further evidence that these fish mature at a smaller size in the Apostle Island region than whitefish in most other areas of the lake. However, the Apostle Island whitefish are older at first maturity than fish from other areas.

The catch of whitefish from the nets set in very shallow water was not appreciably different from the catch in deeper water.

One small-mesh net ( $2\frac{1}{2}$ -inch mesh, 150 feet long) was attached to the large-mesh gangs to sample associated species found on the spawning grounds. Lake herring and menominee whitefish predominated in the catch. The lake herring were large (average weight: 0.9 pounds) and were nearly ready to spawn. Stomachs from the menomi-

nee whitefish were examined. Two contained fish eggs; the rest were empty. The eggs resembled menominee eggs.

Trawling in waters adjacent to the spawning reefs failed to capture spawning whitefish. Tows made east of South Twin Island (25 fathoms) and east of Cat Island (14-27 fathoms) yielded mainly slimy muddlers, ninespine sticklebacks, trout-perch, smelt, and pygmy whitefish. All of the pygmy whitefish were ripe but not yet spawning. Nine immature whitefish were taken by trawls at 27 fathoms at the Cat Island station. The stomachs of these fish contained large numbers of fish eggs. The eggs appeared to be either whitefish or menominee whitefish eggs.

Standard gangs of gill nets were set south of Stockton Island at 33 and 54 fathoms.

Most of the *L. hoyi* were nearly ripe but not as far advanced as the lake herring.

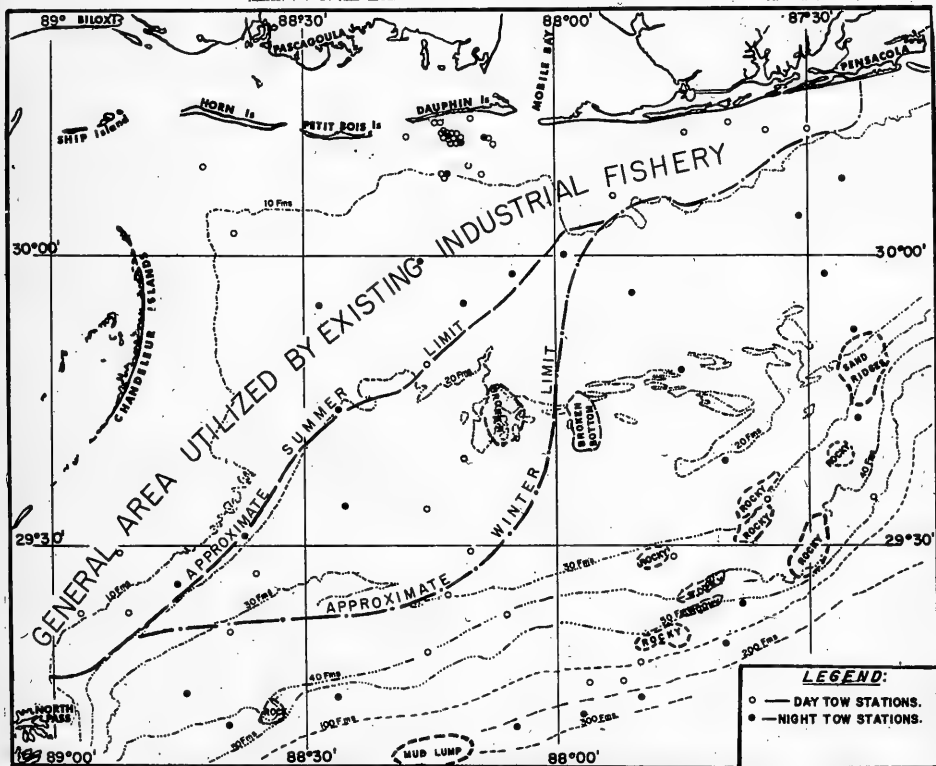
The water was homothermous vertically at all locations visited during the cruise. Surface temperatures ranged from 43.6° F, south of Stockton Island to 40.2° F, on Cat Island Shoal.



## Gulf Exploratory Fishery Program

### EXPLORATORY FISHING FOR INDUSTRIAL FISH CONTINUED:

**M/V "Oregon" Cruise 72:** A 12-day exploratory fishing survey of industrial fish concentrations off the Mississippi and Alabama coasts was completed by the U. S. Bureau of Commercial Fisheries exploratory

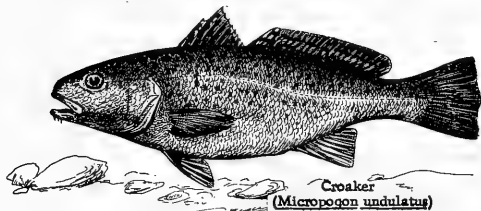


M/V Oregon Cruise 72 (November 18-December 4, 1960).

fishing vessel Oregon on December 4, 1960. The primary objective of this third cruise of a series was to assess the grounds south and east of the area (see chart) usually worked by the north Gulf industrial fish fleet in December. A secondary objective was to delineate and chart foul-bottom areas that are not indicated on navigation charts.

Trawling operations were conducted round-the-clock with 71 drags completed in the 4- to 225-fathom depth range. Geographical positions are indicated as day and night drags on the chart.

Commercial quantities of industrial fish were taken between 4 and 26 fathoms in the area utilized by the industrial fishery. Best fishing was found in 16 fathoms south of Dauphin Island where a 1-hour drag produced 6,000 pounds of croakers (*Micropogon undulatus*) and spot (*Leiostomus xanthurus*). Other drags in the area produced catches ranging up to 3,000 pounds per hour.



Commercial-size catches in areas not utilized by the fishery were confined to the 35- to 42-fathom depth range to the south and in 20 fathoms to the east. Catches in those areas ranged as high as 3,000 pounds per one-hour tow and consisted mainly of croakers (maximum depth limit 20 fathoms), spot (averaging 3 to the pound), and white sea trout (*Cynoscion nothus*). Drags beyond the 40-fathom curve and east of 87°35' west were generally unproductive. There appeared to be no substantial difference in production in day or night drags.

Bottom conditions in the area of commercial fishing were generally suitable for conventional trawl gear with the exception of the broken-bottom areas shown on the chart. Foul bottom was encountered to the southeast and consisted of heavy rock formations (also noted on the chart).

Depth-recorder indications of midwater schools were notably absent during this pe-

riod. The absence of schools is possibly attributable to the unseasonably warm climatic conditions that have prevailed in the north Gulf. Surface water temperature along the 40-fathom curve averaged 73° F., as compared to an average temperature of 68° F. for the December period of 1959.

Standard "Gulf of Mexico"- and "New England"-type industrial fish trawls were used during the survey. The trawls were fished with 10-foot chain doors and single warp and bridle. Limited gear trials were conducted in the lee of Dauphin Island during a three-day period of strong northerly winds. The results suggest little difference in the fish-catching ability of the two types of trawls. It was found that the use of mud rollers on fairly firm bottom, although not affecting the fish catch, reduced the shrimp catch by approximately 50 percent.

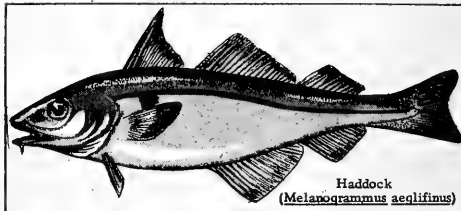
Note: Also see Commercial Fisheries Review for Nov. 1960 p. 34, and Jan. 1961 p. 27



## Haddock

### BIOLOGISTS PREDICT HIGHER LANDINGS FROM GEORGES BANK IN 1961:

Better haddock landings from Georges Bank are expected during 1961, but prospects for 1962 are dim, according to the biologists of the Woods Hole (Mass.) Biological Laboratory of the U. S. Bureau of Commercial Fisheries. The past year has been a good scrod year as a new year-class (1958) grew to marketable size. This year-class was found on



the banks during surveys of the Bureau's research vessel Albatross III two years ago at which time the Laboratory predicted better scrod fishing in 1960. This year-class will support the fishery in 1961 and, since the fish will be larger, landings should hold up well.

Beyond 1961, however, prospects are not so bright. There are no new strong year-classes in the offing. Bureau research ves-



sets surveyed Georges Bank in the fall of 1959 and again in 1960 to assess the strength of the current year-classes. Neither the 1959 nor the 1960 group was as strong as that of 1958. Thus, we can expect poor scrod landings in 1962. Since the 1958 year-class, by that time, will be losing its importance in the catches, we can expect lower total landings of haddock in 1962.

Diversion of efforts to other banks will probably not alleviate the situation as no great abundance of young haddock are showing on other banks either.



## Houston

### CONSUMPTION OF FROZEN FISH AND SHELLFISH IN RESTAURANTS AND INSTITUTIONS:

In Houston, Tex., 83 percent of the 288 establishments surveyed reported buying frozen processed fishery products: fish, shellfish, and portions. Of the 239 reporting purchases of fishery products, 38.6 percent purchased fish; 33.0 percent purchased shellfish; 18.8 percent purchased portions.

Institutions, such as schools and hospitals used more frozen processed fishery products than did public eating places. In terms of the percentage of places buying fish and shellfish, Houston ranked fifth among the ten cities used in the survey.

Cod fillets were the most popular in terms of total pounds purchased during November 1958. Ocean perch fillets, the second most popular, were purchased by 14 percent of the restaurants and institutions surveyed. Half of the Houston purchasers of frozen shellfish bought breaded shrimp during the survey month and almost 40 percent purchased raw peeled and deveined shrimp.

Of the 59 Houston establishments using frozen portions, 65.1 percent purchased the product uncooked-breaded compared to 24.4 percent that purchased the portions uncooked-plain.

Frying was the most widely-used cooking method. Almost 80 percent of the establishments served fried processed fish as compared to about 68 percent and 91 percent serving shellfish and portions, respectively.

Five-sixths of the Houston users of portions cooked them while frozen.

Only a tenth of the Houston establishments using portions said they were more expensive than other forms of frozen processed fish. Half of the users of portions considered them less expensive and a third rated them about the same.



Restaurants and institutions in Houston tended to buy frozen processed fishery products from wholesalers, usually located less than 10 miles away. Fishery wholesalers supplied 58 percent of the establishments; frozen food distributors supplied 34 percent. Deliveries were made once a week and services of the suppliers were satisfactory.

Of the total users of frozen processed fishery products in Houston, 168 establishments were aware that they could buy Government-inspected or graded frozen processed fish and shellfish. Practically all had bought some. When these purchasers were asked if the inspection had affected the amount of frozen processed fish and shellfish which they had bought, 8 percent said the inspection had caused them to buy more.

Note: Also see *Commercial Fisheries Review*, December 1960 p. 38; November 1960 p. 26; May 1960 p. 27; January 1960 p. 32.



## New England

### FOOD-FISH LANDINGS UP BUT INDUSTRIAL-FISH LANDINGS DOWN IN 1960:

The principal New England fishing ports reported for 1960 more food-fish landings but substantially lower industrial fish landings than in 1959, according to a preliminary report from the U. S. Bureau of Commercial Fisheries Market News Service at Boston, Mass. Total food-fish landings in 1960 were 474 million pounds, about 2 percent above 1959; while industrial-fish landings in 1960 totaled only 101 million pounds as compared

with 229 million pounds the previous year.

Lower ex-vessel prices prevailed at all New England ports in 1960. The 1960 ex-vessel value of \$38 million for all landings was \$4 million less than the 1959 total. The largest drop was at New Bedford where scallop prices were down substantially. At Bos-

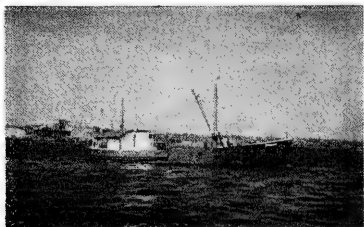


Fig. 1 - Scallop dragger entering New Bedford harbor.

ton and Gloucester the ex-vessel value was also down, due to lower dockside prices for haddock and ocean perch.

Landings at Boston, Gloucester, New Bedford, Provincetown, Woods Hole, Mass.; Portland, Rockland, Maine; Point Judith, R. I.; and Stonington, Conn.--represent about 75 percent of all New England fishery landings.

New England's fishing vessels and shore plants operated at capacity in 1960. However, vessel and plant replacements were few and the aging facilities were taxed heavily to maintain production. Continued use of the Bureau's Fisheries Loan Fund allowed many vessels to continue operation. The enactment of a Federal Vessel Construction Subsidy Program in 1960 offered some promise for the future.

Gloucester continued as the leading food-fish producing port in 1960 with 160 million pounds, followed by Boston with 108 million pounds, New Bedford with 75 million pounds, Portland with 52 million pounds, Rockland with 44 million pounds, Provincetown with 15 million pounds, Point Judith with 13 million pounds, Woods Hole with 4 million pounds, and Stonington with 3 million pounds.

Ocean perch was again the leading food species landed in 1960 at the principal New England ports--141 million pounds--7 million pounds more than in 1959. Haddock

landings totaled 102 million pounds, 5 million pounds more than in 1959. Landings of large haddock were lighter in 1960, but scrod haddock landings were up 6 million pounds. Whiting was next in volume with a total of 79 million pounds as compared with 83 million pounds in 1959.

The total landings of other important food species at the New England ports in 1960 were: flounders 56 million, cod 27 million, scallops 22 million, and pollock 19 million pounds. Of these, only flounder and scallop landings were higher in 1960 than in 1959.

Sea scallops continued to be landed in record volume. The 1960 total of 22 million pounds was 10 percent above the previous year. About 90 percent of the sea scallops were landed at New Bedford, the Nation's leading scallop port.

The industrial-fish fleets at New England's ports suffered from the depressed state of the fish meal market in 1960. Only 101 million pounds of industrial fish were landed as com-

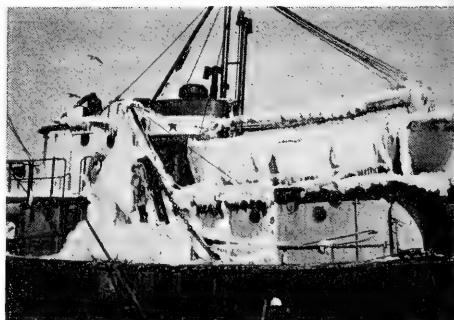


Fig. 2 - The fishing trawler *Bonnie* docked at Boston Fish Pier. Dangerous icing is usual for vessels fishing the North Atlantic in winter.

pared with 229 million pounds the previous year. Point Judith, R. I., Gloucester and New Bedford, Mass., were the hardest hit. Fish meal plants operated well below capacity and one plant at Gloucester was dismantled. Point Judith in 1960 continued as the leading producer of industrial fish, followed by Gloucester, Provincetown, and New Bedford, in that order. The greater part of the industrial fish is used in the manufacture of fish meal and oil, but good large quantities are also used for animal food.

As 1960 ended, stocks of frozen New England-produced fishery products were at good levels in warehouses throughout the Nation, but were about 10 percent under a year earlier. Domestic production was supplemented by imported fishery products that continued to arrive in record volume. Wholesale prices of most frozen fishery products were a shade higher than a year earlier as the year 1960 came to a close.

--By John J. O'Brien,  
Supervisory Fishery Marketing Specialist,  
Branch of Market News,  
U. S. Bureau of Commercial Fisheries,  
Boston, Mass.



## Preservation

### EXTENDING STORAGE LIFE OF FRESH FISHERY PRODUCTS BY USE OF RADIOISOTOPES TO BE STUDIED:

A long-sought objective of the fishing industry, the extension of the storage life of fresh fish and shellfish, was recently brought closer to realization when the U. S. Bureau of Commercial Fisheries and the U. S. Atomic Energy Commission joined forces in a series of studies designed to preserve the characteristics of fresh fishery products by ionizing radiation.

Most fish have a shelf life on ice of about 10 days from the time they are caught. Shucked clams and some other shellfish can be kept on ice for less than half this time. Extension of the shelf life of seafoods, particularly those not amenable to freezing, would open new and diversified markets for the sale of fresh fish.

It is the aim of scientists at the Bureau's Technological Laboratory at Gloucester, Mass., to double or triple the storage life of fresh fishery products by exposing them to small amounts of gamma rays from radioisotopes, and then storing the products at temperatures of 35° to 40° F. Low-level radiation of this type kills or injures bacteria. This treatment, combined with refrigerated storage, retards bacterial multiplication. Ultimately, those bacteria that were injured but not killed are able to grow again and to produce spoilage in the food products. But, by selecting the proper amount of radiation, it is possible to reduce the bacterial population to any predetermined level and

thus prevent the appearance of spoilage for any desired period of time.

One may then ask, why not apply radiation to kill all the bacteria and permit the storage of fresh fish for as long as we can now store canned fish? Chemists of the Bureau have found that they can easily apply levels of radiation sufficiently high to kill all the bacteria present in fish. When they do so, however, such high dosage may result in a loss of the delicate flavor and texture so characteristic of fish and shellfish at their best. Thus, a delicate relationship exists between the amount of radiation applied, the length of refrigerated storage life, and the degree of retention of these fresh flavor and texture properties.

Since fish and shellfish are so desirable for their vitamin and high protein content, as well as for their high degree of palatability, Bureau chemists will also study the effect of radiation on the protein and vitamins of the irradiated foods to insure that when they are ready for marketing, some time in the future, they will contain the same amounts of these essential nutrients as exist in the fresh product. They will also establish minimum radiation levels that will enable extension of the storage life of fishery products 2 or 3 times that of unirradiated products without affecting odor and flavor.



## Shellfish

### DUKE UNIVERSITY RECEIVES GRANT TO STUDY LARVAL DEVELOPMENT OF SHRIMP AND CRABS:

A \$40,000 grant for basic research on shrimp, crabs, barnacles, and other crustacea during the next three years has been awarded to Duke University by the National Science Foundation. The studies will be conducted at the Duke Marine Laboratory located near Beaufort, N. C.

The Laboratory will study under controlled laboratory conditions the larval development of shrimp, blue crabs, and barnacles. The purpose is to determine the best conditions for each species and the effect of constant salinity-temperature combinations on the frequency of molting and the time required for complete development. Secondary objectives are to find the effects of light and diet on the number of larval stages, the time

required for complete development, and the relationship of physical factors to survival.

Duke researchers have already reared in the Laboratory certain species of blue crabs.

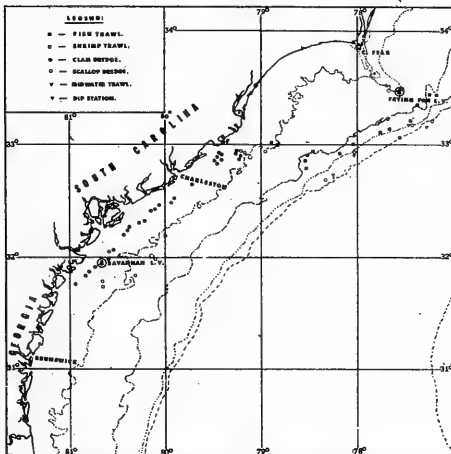


## South Atlantic Exploratory

### Fishery Program

#### FISH AND SHELLFISH RESOURCES OFF COASTS OF NORTH AND SOUTH CAROLINA AND GEORGIA SURVEYED:

M/V "Silver Bay" Cruise 27: The U. S. Bureau of Commercial Fisheries chartered fishing vessel Silver Bay completed a 15-day exploratory fishing trip on December 16, 1960, off Georgia, South Carolina, and North Carolina. Scallop dredges, clam dredges, shrimp trawls, and fish trawls were used at 56 stations.



M/V Silver Bay Cruise 27 (December 1-December 16, 1960).

Trawling transects were completed between Port Royal Sound and Frying Pan Shoal light ship in depths of 5 to 115 fathoms. Numerous depth-recorder tracings of near-bottom fish schools were observed in the vicinity of 33°10' north latitude and 77°45' west longitude in depths of 20 to 50 fathoms. Attempts to sample these indications with fish trawls were uniformly unsuccessful with the exception of one 1-hour tow in 30 to 40

fathoms which caught 900 pounds of grunts, 750 pounds of goatfish, 440 pounds of vermilion snapper, and 130 pounds of mixed scrap species. One complete rig (trawl, bridle, and doors) was lost on a hang-up in this area.

Clam dredging was conducted between Cape Romain and St. Catherine Sound using a 14-tooth "Fall River" clam dredge in depths of 4 to 8 fathoms. A few live clams (Venus mercenaria) in the 3- to 5-inch size range were caught but no beds were noted. Large concentrations of dead Venus shells were dredged at some stations, possibly indicative of clam beds in shallower depths than could be reached by the Silver Bay.

Surface trolling between stations produced five little tuna (Euthynnus alletteratus) and one big-eyed tuna (Thunnus obesus).

Note: Also see Commercial Fisheries Review, October 1960 p. 42.



## United States Fishing Fleet<sup>1</sup>/Additions

### OCTOBER 1960:

A total of 31 vessels of 5 net tons and over were issued first documents as fishing craft

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, October 1960

Area	October 1960		Jan.-Oct. 1959		Total	
	1960	1959	1960	1959	1960	1959
	(Number)					
New England . . . . .	4	1	30	14	15	
Middle Atlantic . . . . .	1	1	13	11	12	
Chesapeake . . . . .	10	18	66	87	106	
South Atlantic . . . . .	1	2	42	71	76	
Gulf . . . . .	8	8	75	125	135	
Pacific . . . . .	5	4	105	88	97	
Great Lakes . . . . .	-	-	12	6	6	
Alaska . . . . .	2	-	23	31	32	
Total . . . . .	31	34	366	433	479	

Note: Vessels assigned to the various areas on the basis of their home ports.

during October 1960--a decrease of 3 vessels as compared with the same month of 1959. The Chesapeake area led with 10 vessels. The Gulf area was second with 8, and the Pacific was third with 5 vessels. New England followed with 4, Alaska with 2, and the Middle Atlantic and South Atlantic areas with 1 each.

During the first ten months of 1960, a total

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, October 1960

Net Tons	Number
5 to 9 . . . . .	17
10 to 19 . . . . .	8
20 to 29 . . . . .	2
40 to 49 . . . . .	2
80 to 89 . . . . .	1
190 to 199 . . . . .	1
Total . . . . .	31

<sup>1</sup>/Includes both commercial and sport fishing craft.

of 366 vessels were issued first documents as fishing craft--67 less the same period of 1959. Most of the decline occurred in the Gulf area--a drop of 50 vessels as compared with the 1959 ten-months period.

\* \* \* \* \*

### NOVEMBER 1960:

During November 1960 26 vessels of 5 net tons and over were issued first documents as fishing craft--6 less than in November 1959. The Chesapeake led all other areas

Table 1 - U. S. Vessels Issued First Documents as Fishing Craft by Areas, November 1960

Area	November		Jan., -Nov.		Total
	1960	1959	1960	1959	
	(Number)				
New England . . . . .	2	1	32	15	15
Middle Atlantic . . . . .	-	1	13	12	12
Chesapeake . . . . .	8	13	74	100	106
South Atlantic . . . . .	2	3	44	74	76
Gulf . . . . .	5	6	80	131	135
Pacific . . . . .	4	7	110	95	97
Great Lakes . . . . .	-	-	16	6	6
Alaska . . . . .	-	1	23	32	32
Total . . . . .	26	32	392	465	479

Note: Vessels assigned to the various areas on the basis of their home ports.

with 8 vessels, followed by the Gulf and Pacific each with 5, the Great Lakes with 4, while the New England and South Atlantic areas accounted for the remaining 4.

Table 2 - U. S. Vessels Issued First Documents as Fishing Craft by Tonnage, November 1960

Net Tons	Number
5 to 9 . . . . .	15
10 to 19 . . . . .	6
20 to 29 . . . . .	2
30 to 39 . . . . .	1
40 to 49 . . . . .	1
50 to 59 . . . . .	1
Total . . . . .	26

A total of 392 vessels were issued first documents as fishing craft during the first eleven months of 1960--73 less than during the same period of 1959.



## U. S. Fish Meal and Solubles Production and Imports, January-November 1960

During the first eleven months of 1960, the United States production of fish meal amounted to 251,200 tons, compared with 266,900 tons for the same period in 1959. There was a drop of nearly 4,000 tons of Alaska herring meal, 3,400 tons of tuna and mackerel meal, and 7,200 tons of meal from other countries. The production of menhaden meal during the 1960 eleven-months period declined only 1,000 tons.

Imports of fish meal totaled 116,000 tons for the period January-November 1960--11,400 tons less than in the same period of 1959. Imports from Peru (58,200 tons) made up 50 percent of the total, while Canada followed with the next largest amount (29,600 tons). The remaining 28,200 tons were received from Chile, Union of South Africa, Angola, and other countries.

U. S. Supply of Fish Meal and Solubles, 1960 and 1959			
Item	January-November		Total
	1960	1959	
	(Tons)		
<b>Fish Meal:</b>			
<b>Domestic production:</b>			
Menhaden . . . . .	210,932	211,949	223,893
Tuna and mackerel . . . . .	19,264	22,685	25,380
Herring, Alaska . . . . .	4,126	8,094	8,094
Other . . . . .	16,889	24,138	49,184
<b>Total production . . . . .</b>	<b>1,251,211</b>	<b>1,266,866</b>	<b>306,551</b>
<b>Imports:</b>			
Canada . . . . .	29,588	37,109	39,033
Peru . . . . .	58,152	47,495	49,923
Chile . . . . .	17,990	4,995	5,104
Angola . . . . .	360	20,738	20,738
Union of South Africa . . . . .	6,672	8,842	9,727
Other countries . . . . .	3,235	6,238	8,400
<b>Total imports . . . . .</b>	<b>115,997</b>	<b>127,417</b>	<b>132,925</b>
<b>Available fish meal supply . . . . .</b>	<b>367,208</b>	<b>394,283</b>	<b>439,476</b>
<b>Fish Solubles (Wet Weight):</b>			
Domestic production <sup>2/</sup> . . . . .	96,101	159,930	165,359
<b>Imports:</b>			
Canada . . . . .	809	1,377	1,660
Denmark . . . . .	1,858	18,723	18,723
Other countries . . . . .	447	6,110	6,247
<b>Total imports . . . . .</b>	<b>3,114</b>	<b>26,210</b>	<b>26,630</b>
<b>Available fish solubles supply . . . . .</b>	<b>99,215</b>	<b>186,140</b>	<b>191,989</b>

<sup>1/</sup>Based on reports from firms which accounted for 92 percent of the 1959 production.

<sup>2/</sup>Includes production of homogenized-condensed fish.

During the first eleven months of 1960, the domestic production of fish-solubles amounted to 96,100 tons--a drop of 63,800 tons compared with the same period of 1959. Imports of fish solubles totaled 3,100 tons during the 1960 eleven-months period compared with 26,200 tons for the 1959 eleven-months period.



## U. S. Foreign Trade

### EDIBLE FISHERY PRODUCTS, OCTOBER 1960:

Imports of edible fresh, frozen, and processed fish and shellfish into the United States during October 1960 increased by 9.6 percent in quantity and 13.9 percent in value as compared with September 1960. The increase was due primarily to higher imports of frozen albacore tuna (up 3.6 million pounds) and frozen shrimp (up 6.0 million pounds), and to

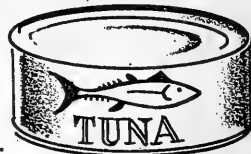
a lesser degree, an increase in the imports of fresh, frozen, and canned salmon. The increase was partly offset by a 2.0-million-pound decrease in the imports of tuna other than albacore.

Compared with October 1959, the imports in October 1960 were lower by 13.6 percent in quantity and 1.3 percent in value due to a drop in the imports of frozen groundfish and other fillets (down 12.4 million pounds), canned tuna in brine (down 3.0 million pounds), and frozen tuna other than albacore (down 4.6 million pounds). Compensating, in part, for the decreases was an increase of about 4.2 million pounds in the imports of frozen albacore tuna and fresh and frozen salmon (up 1.6 million pounds).

ports in excess of the quota will be dutiable at 25 percent ad valorem.

Imports from January 1-December 3, 1960, amounted to 46,563,451 pounds, according to data compiled by the U. S. Bureau of Customs.

A total of 49,966,082 pounds had been imported from January 1-November 28, 1959.



**Wholesale Prices, December 1960**

The December 1960 wholesale price index for edible fishery products (fresh, frozen, and canned) at 133.2 percent of the 1947-49 average was up 1.3 percent from the preceding month and 8.6 percent above the same month of 1959. The December 1960 wholesale price index was at the highest point for the year and was the second highest (reached 134.8 in December 1958) for the 1951-60 period. The increase from November 1960 to December 1960 was due mainly to higher ex-vessel haddock prices at Boston following some severe weather. From December 1959 to December 1960, all prices in the fishery products wholesale index rose except those for frozen dressed halibut, fresh yellow pike, and Maine and California canned sardines.

The drawn, dressed, and whole finfish subgroup index in December 1960 was up 5.0 percent from the preceding

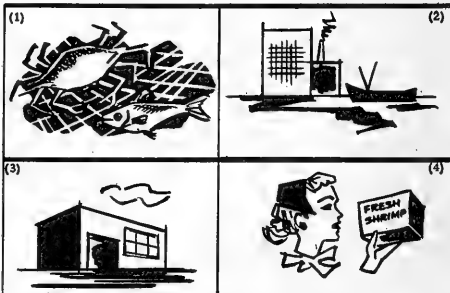
Item	Quantity			Value		
	October	Year	October	Year	Year	
	1960	1959	1959	1960	1959	1959
Imports:	(Millions of Lbs.)			(Millions of \$)		
Fish & shellfish: Fresh, frozen, & processed/	97.4	112.8	1,070.5	29.5	29.9	309.6
Exports:						
Fish & shellfish: Processed only/ (excluding fresh & frozen)	6.1	6.3	68.0	2.8	1.9	22.8
1/ Includes pastes, sauces, clam chowder and juice, and other specialties.						

United States exports of processed fish and shellfish in October 1960 were lower by 2.3 percent in quantity and 17.6 percent in value as compared with September 1960. Compared with the same month in 1959, the exports in October 1960 were lower by 1.7 percent in quantity, but were up about 47.4 percent in value. The lower volume of exports in October 1960 as compared with the same month in 1959 was due primarily to a drop of about 1.1 million pounds in the exports of California sardines. The increase in value from October 1959 to October 1960 was due to higher exports of relatively high-priced items such as canned salmon and frozen shrimp.

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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 im-



port. Mid-December 1960 price increases of 34.2 percent for large drawn haddock at Boston and 7.1 percent for fresh round whitefish at New York City were mainly responsible. From December 1959 to December 1960, the subgroup index rose 12.1 percent due to sharply higher prices for dressed whitefish at Chicago (up 61.2 percent), plus frozen dressed king salmon (up 18.0 percent), and fresh drawn large haddock at Boston (up 8.6 percent). The increases were partially offset by lower prices for frozen dressed halibut and fresh yellow pike at New York City.

The fresh processed fish and shellfish subgroup index increased 3.6 percent from November to December 1960—the short supplies of haddock on the Boston market in mid-December 1960 caused a spurt of 25.6 percent in

the prices for fresh haddock filets, and fresh shrimp prices at New York City increased 4.3 percent. Prices for fresh shucked oysters at Norfolk continued unchanged from the preceding two months. From December 1959 to December 1960, prices in the subgroup increased 9.1 percent. All subgroup items were higher priced in December 1960 as compared with December 1959.

The frozen processed fish and shellfish subgroup index dropped 3.8 percent from November to December 1960 due to lower frozen shrimp prices at Chicago and slightly lower frozen flounder fillet prices at Boston, but prices for haddock and ocean perch filets were unchanged. As compared with December 1959, December 1960 wholesale frozen fillet prices were higher due to lower inventories, also the frozen shrimp prices at Chicago were up about 8.2 percent.

Canned fish prices in December 1960 were about unchanged (down 0.3 percent) from the preceding month except for canned lightmeat tuna which was down 10 cents a case. However, December 1960 canned fish prices were up 5.8 percent from the same month of 1959 due to higher prices for canned pink salmon (up 12.3 percent) and canned lightmeat tuna (up 1.2 percent). Both canned salmon and canned California sardines are in very light supply until the 1961 packing season for each gets under way. At the end of December 1960, the annual pack of tuna set a new record. In spite of the excellent pack, good demand and canners' promotion efforts have maintained a reasonably steady market for canned tuna. In the early months of 1961 supplies of canned tuna will be liberal and supplies of Maine sardines will be moderate.

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

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/		Indexes			
			(\$)		(1947-49=100)			
			Dec. 1960	Nov. 1960	Dec. 1960	Nov. 1960	Oct. 1960	Dec. 1959
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned) . . . . .					133.2	131.5	129.4	122.7
<b>Fresh &amp; Frozen Fishery Products:</b> . . . . .					150.0	146.9	143.7	136.4
<b>Drawn, Dressed, or Whole Finfish:</b> . . . . .					173.6	165.4	166.4	154.8
Haddock, lge., offshore, drawn, fresh . . . . .	Boston	lb.	.18	.13	178.0	132.6	141.5	163.9
Halibut, West., 20/30 lbs., drsd., fresh or froz. . . . .	New York	lb.	.30	.30	92.8	92.3	94.4	96.4
Salmon, king, lge. & med., drsd., fresh or froz. . . . .	New York	lb.	.90	.90	202.2	202.2	202.2	171.3
Whitefish, L. Superior, drawn, fresh . . . . .	Chicago	lb.	.75	.75	185.9	185.9	183.5	115.3
Whitefish, L. Erie pound or gill net, rnd., fresh . . . . .	New York	lb.	.75	.70	151.7	141.6	149.7	177.0
Yellow pike, L. Michigan & Huron, rnd., fresh . . . . .	New York	lb.	.50	.70	117.3	164.1	134.8	138.4
<b>Processed, Fresh (Fish &amp; Shellfish):</b> . . . . .					146.8	141.7	135.3	134.6
Filets, haddock, sml., skins on, 20-lb. tins . . . . .	Boston	lb.	.52	.41	175.2	139.5	163.8	166.7
Shrimp, lge. (26-30 count), headless, fresh. . . . .	New York	lb.	.73	.70	114.5	109.8	102.7	101.9
Oysters, shucked, standards . . . . .	Norfolk	gal.	7.50	7.50	185.6	185.6	185.6	173.2
<b>Processed, Frozen (Fish &amp; Shellfish):</b> . . . . .					115.0	119.6	115.7	106.8
Filets: Flounder, skinless, 1-lb. pkg. . . . .	Boston	lb.	.39	.40	102.1	103.4	102.1	98.1
Haddock, sml., skins on, 1-lb. pkg. . . . .	Boston	lb.	.34	.34	106.7	106.7	91.0	97.3
Ocean perch, skins on, 1-lb. pkg. . . . .	Boston	lb.	.30	.30	118.8	118.8	112.8	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg. . . . .	Chicago	lb.	.69	.74	106.5	114.2	114.2	98.4
<b>Canned Fishery Products:</b> . . . . .					109.8	110.1	109.6	103.8
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs. . . . .	Seattle	cs.	27.50	27.50	143.5	143.5	140.9	127.8
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	11.00	11.10	79.3	80.0	80.0	77.9
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 48 cans/cs. . . . .	Los Angeles	cs.	7.65	7.65	89.8	89.8	91.0	93.9
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs. . . . .	New York	cs.	8.50	8.50	90.5	90.5	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.





## International

### FOOD AND AGRICULTURE ORGANIZATION

#### BIOLOGIST TO SURVEY SHRIMP RESOURCES OFF LATIN AMERICA:

A marine biologist engaged in fisheries research at the U. S. Bureau of Commercial Fisheries Biological Laboratory at Woods Hole, Mass., arrived in Latin America in December 1960 to begin a Food and Agriculture Organization (FAO) assignment as a shrimp biologist. The United States biologist was sent to Latin America to survey the shrimp resources of the south coast of Brazil, Uruguay, and Argentina. During his year-long assignment to FAO, he will undertake the training of fisheries staffs in these



three countries in principles and methods of fisheries biology.

\* \* \* \* \*

#### MODERN FISH PROCESSING YIELDS NEW PRODUCTS:

With modern processing, fish are beginning to be found in many new products, according to the Food and Agriculture Organization, Rome, Italy. For instance, there are new fish wieners, noodles and flour, fish sauces, tuna "ham," and shrimp "krupuks" which are eaten like potato chips. Processing has not only developed new fish products, but by applying modern methods of preservation, has enabled countries to boost their fish consumption and exports.

In the Indo-Pacific region, where the hot, humid tropical climate and lack of developed transportation have acted as deterrents in the marketing of fish, processing has been one of the keys in fishery development. India, within the past six years, has coupled the discovery of new shrimp grounds with improved methods of handling and processing

to raise her shrimp landings to where she is now an important exporter of shrimp.

The landings of marine fish in the Indo-Pacific area (excluding Japan and Mainland China) have steadily climbed from 2.7 million metric tons in 1954 to about 3.4 million metric tons in 1959. Processing has kept pace with the output, devising new products such as the fish sausage or wieners.

The wieners, a tasty combination of chiefly tuna, marlin, and whale meat, are manufactured in Japan and exported to the United States and to such citadels of wiener consumption as Germany and Austria. This Japanese industry, developed in the past five years, began in 1954 with a 2,000-ton output. This rose to 59,000 tons in 1958 and the industry predicts a 100,000-ton production in the near future. One factory, alone, manufactures 500,000 pieces of fish sausage daily.

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#### NEW BRITISH TRAWLER NAMED AFTER FISHERIES DIRECTOR:

The M/V D. B. Finn, a British distant-water trawler, has been named after the Director of the Food and Agriculture Organization (FAO). Launched at Goole, England, the vessel was christened by the wife of the Director. Dr. Finn sent a cable from Penang, Malaya, where he is on an official FAO visit, expressing his best wishes for successful voyages for the new vessel.

The trawler was named in tribute to the FAO's Fisheries Division that Dr. Finn heads, and for the fine work that his Division has contributed to the fishery industry.

The vessel is equipped with all the modern aids to fishing in their most advanced stage, so that the skipper will be able to exercise push-button control over his vessel. She has automatic steering, gyro compass, direct-engine control, fish-finding instru-



## International (Contd.):

ments, two radar sets and a radar track indicator, an electric log, plus switches for stopping the winch, etc.

The new trawler has a bulbous bow, developed after extensive tank tests done in collaboration with the National Physics Laboratory at Teddington, England. It is expected that, with this type of bow, the ship will have a speed in excess of 15 knots.

The M/V D. B. Finn has an over-all length of 202½ feet and will accommodate a crew of 31. She is designed for starboard fishing only and has a fish storage capacity of 18,250 cubic feet.

Dr. Finn, a former Canadian Deputy Minister of Fisheries, joined FAO in his current post in 1946. Along with directing the work of his Division, he has represented FAO on many international bodies and at conferences dealing with fisheries.

## GENERAL AGREEMENT ON TARIFFS AND TRADE

FIRST PHASE OF SEVENTEENTH SESSION OF CONTRACTING PARTIES ENDS:

Trade matters of fundamental importance to the nations that participate in the work of the General Agreement on Tariffs and Trade (GATT) were dealt with at the Seventeenth Session of the Contracting Parties which ended November 19, 1960. In line with its over-all trade expansion program, the United States continued to make full use of the opportunities afforded by the GATT to press for the removal of restrictions on United States exports. Among the items considered at the Geneva meeting were the removal of import restrictions, the GATT program for the expansion of trade, the formation of regional markets, the problem of the avoidance of market disruption, and accession by a number of newly-independent and other countries. The second phase of the Seventeenth Session was scheduled to begin in January 1961.

During the session the United States urged the early removal of restrictions on imports of United States products, both in the multilateral forum of the GATT and in informal, bilateral consultations.

The GATT Committee on Balance-of-Payments Restrictions shortly before and during the session conducted consultations with Ceylon, Denmark, Finland, Israel, Japan, New

Zealand, Norway, and Pakistan on the quantitative import restrictions each maintains to protect its balance of payments. In the consultations, the United States urged the consulting countries to relax their import restrictions as quickly as their balance-of-payments positions permit and, in particular, to eliminate any remaining discrimination against American goods, including that arising from commitments under bilateral arrangements. The Committee's annual report on the discriminatory application of import restrictions noted that, despite conspicuous progress in recent months in eliminating so-called discrimination, many countries continue to discriminate against imports from dollar countries as well as against imports from other sources. In approving the report, the Contracting Parties urged the rapid elimination of discrimination.

The Contracting Parties also examined import restrictions maintained by Germany and Belgium. During the session, Italy announced that a large number of industrial items, and some agricultural products, would be liberalized. The United States also requested multilateral examination of restrictions maintained by France.

Bilateral consultations held between the United States and representatives of France, Greece, Japan, Norway, and Sweden covered specific trade problems in a wide range of industrial and agricultural products. The United States was assured that consideration would be given to easing of the restrictions.

Before the end of the session, Uruguay announced that it had eliminated the quantitative import restrictions which had previously been maintained for balance-of-payments reasons.

During the discussion of the general problem of import restrictions, the Contracting Parties reaffirmed their view that special efforts should be directed toward the removal of all restrictions not justified under the General Agreement. They also agreed to new procedures for the quick and effective consideration of, and consultation on, any future restrictions which countries might consider necessary to safeguard their foreign exchange reserves.

The work of GATT Committees II and III, established at an earlier session to study agricultural protectionism and obstacles to the trade of the less-developed countries, was

## International (Contd.):

reviewed by the Contracting Parties. Committee II, after consultations with most of the major agricultural exporters, is now assessing the effects of national agricultural policies on world trade in agricultural products. The disadvantages of high levels of protection have already been clearly brought out by the Committee's work. Fishery products were also included in the study.

Committee III recognizes the importance of trade to the economic development of less-developed countries. The objectives of this GATT program, unique among the efforts of international bodies to deal with the trade problems of the less-developed countries, are to enlarge the present markets of these countries and accelerate diversification of their exports. To date, the Committee has identified obstacles to expansion of trade of the less-developed countries and has called on governments to examine urgently the possibilities of eliminating or reducing such obstacles. Many nations noted with concern the little progress made by some industrial countries in this respect. The Committee has also considered steps that the less-developed countries themselves can take to expand their trade.

As at previous sessions, a spokesman for the European Economic Community (EEC) reported on developments in the Community during the last six months. The United States after reiterating its support for the successful integration of the member states within a liberal trade pattern, stressed the importance of a liberal common agricultural policy in harmony with the GATT objective of expanding international trade. The United States also expressed the hope that commodity problems, particularly those faced by certain less-developed countries, would be taken into account by the Community.

While no decision was taken as to the conformity with the GATT of the provisions of the Stockholm convention, which established the European Free Trade Association (EFTA), the belief that the Convention as a whole is in harmony with the spirit of the General agreement was restated by the United States and a number of other countries. The Contracting Parties agreed that there remained certain legal and practical issues which could not be fruitfully discussed further at this stage. The seven-member group (Aus-

tria; Denmark, Norway, Portugal, Sweden, Switzerland, United Kingdom) indicated its readiness to furnish further information as requested by the Contracting Parties.

Careful examination was given to the Treaty of Montevideo which will establish the Latin American Free Trade Area, a grouping of Brazil, Chile, Peru, Uruguay, Argentina, Mexico, and Paraguay. The review of the Treaty in the light of the objectives and provisions of the General Agreement resulted in the adoption by the Contracting Parties of conclusions which should permit the Latin American countries to proceed with the ratification and application of the Montevideo Treaty. The representatives of the South American countries declared the intention of their governments to observe their international commitments, including those under the GATT, and to provide the GATT Contracting Parties with all useful information as the Latin American Free Trade Area develops. The United States expressed the belief that the Latin American Free Trade Area, acting in conformity with GATT provisions and principles, could lead to the expansion of trade and advance the welfare of countries both within and without the proposed free-trade area.

Primacy of the GATT in the trade field was reemphasized by the United States in the discussion of the negotiations in progress in Paris to reconstitute the Organization for European Economic Cooperation (OEEC) into the Organization for Economic Cooperation and Development (OECD). The new body, in which the United States and Canada also plan to participate, is seen as a means of strengthening international economic cooperation in the broad field of national economic policy and of increasing and improving the flow of development assistance to the less-developed countries. Importance was attached to the maintenance of close liaison between the two bodies.

Discussion of the continued failure of some countries to apply the General Agreement to Japan highlighted consideration of the problem of the avoidance of market disruption. The adverse economic, political, and social repercussions that sharp increases in imports in a narrow range of commodities could have in some importing countries has caused general concern. The program laid out by the GATT calls for finding practical ways to facilitate the expansion of trade

## International (Contd.):

while avoiding these possible adverse effects. At the Spring Session of the GATT, a working party was established to consider the general problem. This group presented the outline of a program which will enable the Secretariats of the GATT and the International Labor Office to study the underlying social and commercial factors. To supervise the study program and assist in the solution of immediate problems, the Contracting Parties at the Seventeenth Session established a standing Committee on Market Disruption.

New voluntary consultative procedures for bilateral and multilateral examination of these problems were agreed upon as a practical first step towards solution of specific problems. The standing Committee will continue to search for a generally acceptable multilateral solution of such problems.

A noteworthy accomplishment of the session was the opening for acceptance of a declaration whereby it is hoped that the major trading nations will renounce the use of export subsidies on manufactured products that tend to disturb normal competition.

Harry Shooshan represented the Department of the Interior on the U. S. Delegation to the Seventeenth Session.

## INDO-PACIFIC FISHERIES COUNCIL

SPONSORS TRAINING CENTER ON FISH-PROCESSING TECHNOLOGY:

To continue the upward trend in fisheries development in the Indo-Pacific area, which yields the world's third largest catch of fish, the Food and Agriculture Organization (FAO) sponsored Indo-Pacific Fisheries Council (IPFC) has recommended that a training center on fish-processing technology, with particular reference to the curing of fish in humid, tropical climates, be held in that area. At the invitation of the Republic of the Philippines, a six-weeks training center is scheduled at Quezon City, P. I., beginning March 6, 1961.

The 17 IPFC member countries, which cover an area roughly bordered in the north by Japan, the south by Australia, in the east by Pakistan, and the west by Hawaii, have been invited to send participants to attend the center.

The Training Center is designed to give participants an opportunity to get practical experience in the various means of utilizing fish in humid tropical climates, and to compare the different processing methods. This will include demonstrations of salting, drying, and smoke-curing fish, and preparing fermented and processed fish products. Freezing and cold storage of fish and shrimp will also be demonstrated along with discussions of the methods and equipment needed to manufacture fish meal, flour, oil, and liver oil. This will enable the participants to define as precisely as possible the defects in the fish-curing industry, and to learn methods of investigation of fish processing and quality control.

Discussion of suitable food legislation and regulations concerning fish handling and processing in the countries of the region is planned, and will be based on papers submitted by center participants.

Results from the center's training program plus information collected from the region will be used by FAO for a handbook and manual on fish processing.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENTNEW ORGANIZATION TO REPLACE "ORGANIZATION FOR EUROPEAN ECONOMIC COOPERATION":

The Ministers of 20 Governments, met in Paris on December 14, 1960, and signed the Convention creating the Organisation for Economic Cooperation and Development (OECD) which is to take the place of the Organisation for European Economic Cooperation (OEEC) as soon as the Convention has been ratified or approved by at least 15 Signatory Countries. The Governments of the following countries were represented: Austria, Belgium, Canada, Denmark, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. At the same Conference the Ministers also approved a report recommending the structure and the activities which the new Organization will have at its inception.

Canada and the United States joined with the 18 European countries members of the OEEC in agreeing to sign on December 14, 1960, a convention setting up the OECD.

### International (Contd.):

With the recovery and progress of the European economy, sustained by the generous aid of the United States as well as of Canada, and furthered by the cooperation established within the OEEC, the European countries are now in a position to face, in full and close cooperation with Canada and the United States, the important new tasks and the broader objectives of today.

These objectives are set forth in the convention in these terms:

To achieve the highest sustainable economic growth and employment and a rising standard of living in the member countries while maintaining financial stability and, thus, to contribute to the development of the world economy; to contribute to sound economic expansion in member, as well as non-member countries in the process of economic development; and to contribute to the expansion of world trade on a multilateral non-discriminatory basis in accordance with international obligation.

The convention provides for the establishment of a council, the supreme body of the organization, which will have the power to take decisions and make recommendations by mutual agreement of all the Members. In addition, the ministers agreed on a committee structure to assist in implementing the aims and carrying out the activities of the organization.

The OECD will extend and strengthen the OEEC practice of consultation on the economic situation and policies of member countries. It will pay special attention to the international effects of national policies, with a view to establishing a climate of mutual understanding conducive to the harmonious adjustment of policies. These consultations will be a major activity in pursuing the objective of economic growth, essential to enable the member countries to fulfill their responsibilities in the world economy.

The OECD will have important functions in the matter of assistance to developing countries. The 20 governments have agreed in the convention to contribute to the economic development of both member and nonmember countries in the process of economic development by appropriate means and, in particular, by the flow of capital to those coun-

tries, having regard to the importance to their economies of receiving technical assistance and of securing expanding export markets. Most of the organs of OECD will have a part to play in the realization of this undertaking. The 11-member Development Assistance Group, set up earlier this year, will, upon the inception of the OECD, be constituted as the Development Assistance Committee. This Committee will continue to consult on the methods for making national resources available for assisting countries and areas in the process of economic development, and for expanding and improving the flow of long-term funds and other development assistance to them.

In the field of trade the OECD will carry out the following functions:

Confrontation on general trade policies and practices at regular intervals or when requested by a member; examination of specific trade problems primarily of interest to members; and consideration of any outstanding short and long-term problems falling within the terms of reference of the Committee on Trade Problems established in January 1960.

In addition to these activities, the OECD will expand and strengthen those activities of the OEEC which have proved their practical value for more than a decade and which are to be taken over by the OECD in pursuance of its objectives. The OECD will thus be able to fulfill the desire of the countries which have created it by becoming the forum in which 20 countries will consult, cooperate closely, and where appropriate take coordinated action to meet the economic tasks which face them today.



## Angola

### FISHING INDUSTRY BEING REORGANIZED:

Preparations are being made to reorganize the Angolan fishing industry. Scientific studies are being made of the fish found in Angolan waters, technical and economic studies are being undertaken on the industrial plants, and marketing studies are being prepared. A central concept of the reorganization plan is the proposed concentration of the industry into a limited number of large cooperatives made up of modern, economic processing plants. Fish fillets and canned and dried fish are to become the principal

## Angola (Contd.):

products of the industry, with fish meal and oil as important byproducts. Up to now the fishing industry has been concentrating on fish meal and oil.

This extensive reorganization presupposes modernizing many existing plants, and the construction of new facilities, especially for producing canned and frozen fish.



## Argentina

### FISH MEAL AND OIL INDUSTRY:

As of November 1960, there were 10 fish-meal plants in Argentina reducing fresh-water fish and 6 reducing marine fish (only 4 of the 6 are in operation in Mar del Plata). The source of raw material for the 4 plants is waste from canning and filleting. When operating, the other 2 plants use whole fish—principally trawl-caught hake (*Merluccius*) when they are able to obtain boats and crews.

Plans have been projected for two other marine fish-meal plants—one for Mar del Plata to operate on filleting wastes, and one for Rawson. It probably will be a year before these plants are ready to operate.

The plants that reduce salt-water fish use homemade, secondhand United States equipment, and highly modern equipment capable of concentrating stickwater and adding it to the meal in the dryer. The more modern plants are of Danish origin. In general, the plants are about equally divided between direct-flame and steam-drying.

The marine plants use only scrap from canning and filleting operations and whole fish that is not used for human consumption. The Mar del Plata plants principally utilize hake (*Merluccius*), anchovy or sardines (*Engraulis*), and mackerel (*Pneumatophorus*). The mackerel and hake scrap is usually unsalted, but the anchovy scrap is very heavily salted.

The hake scrap is reported to give 50 to 60 percent protein, 22 to 30 percent ash, and moisture and fat from 6 to 7.5 percent. The anchovy scrap yields 40 to 50 percent protein with as much as 10 percent salt. Oil recovery on scrap is extremely low.

Of the ten plants reducing fresh-water fish, most are quite primitive; only one has a rotary direct-flame dryer, and only 2 use centrifuges for separating the oil.

The sabalo (*Prochilodus platensis*) is not related to the sabalo or tarpon of Mexico, but is a fresh-water fish caught in large beach seines which are set from oared skiffs and hauled ashore by teams of horses. In one plant the whole fish are elevated into metal bins by an endless bucket device and cooked in live steam. The more usual system is to dump the fish into metal vats where they are cooked 3 to 4 hours by direct heat. Some of these vats may hold as many as 10 to 12 tons of fish. The oil and water mixture is drained off from the bottom of the vats into settling tanks. The cooked fish are hand-pressed in screw presses and then spread out on a cement platform to dry. Drying takes from 1 to 4 days. The dried fish are then ground into meal.

The fresh-water plants are regulated by a season (October through March), and each plant is given a quota. The largest plant has a seasonal quota of 2,500 tons of raw fish a season.

The sabalo is extremely fat fish; it yields 12 to 12.5 percent oil on a fresh-fish weight basis for those plants having centrifuges.

Analysis of sabalo oil shows a moisture content of 0.2 to 0.6 percent, acidity from 0.82 to 1.0 percent, and a nonsaponifiable rating of 1.5 to 2.0 percent. Another source gave acidity between 1.6 and 12.0 percent and a nonsaponifiable rating of 1.0 to 3.5 percent and an iodine number of 95 to 130.

Sabalo meal from artificial drying was reported as 57 to 65 percent protein, 8.5 to 10.0 percent fat, 6.2 to 6.8 percent moisture, and 3.5 to 4.5 percent sand.

Sun-dried meal shows between 7 to 9 percent moisture, 50 to 60 percent protein, 8 to 10 percent fat,  $\frac{1}{2}$  percent salt, and 6 to 8 percent sand.

In 1959 a total of about 4,000 metric tons of fish meal and 700 metric tons of fish oil were produced. The marine plants produced 2,755 tons of meal and 7 tons of oil; the fresh-water fish plants produced 1,217 tons of fish meal and 694 tons of oil.

The salt-water meal and oil industry is of recent origin whereas fresh-water fish reduction has been in progress 60 years. Peak fresh-water reduction was reached in 1948 when 10,600 metric tons of sabalo were used to produce 1,100 tons of meal and 1,900 tons oil. Oil is the mainstay of the fresh-water reduction plants. Salt-water reduction plants came into being because of high prices for meal, until recently, and as a means of disposing of cannery, and more recently, filleting scrap.

At present, the Mar del Plata reduction plants are paying nothing for the scrap they receive from processing plants (there are reported to be some 30 or more canneries in Mar del Plata), as the cost of disposal of scrap is more than the cost of delivery to the reduction plants. This situation is quite recent though and has resulted from the depressed world market for meal. Previously, reduction plants were paying 15 centavos a kilo (US\$1.85 a metric ton) for scrap.

In fresh-water reduction plants, the company furnishes the nets, skiffs, horses, and carts and may have their own fishermen whom they pay monthly salaries and lodgings or a contractor provides the crew and their sustenance at a fixed price per ton. A top fisherman earns 3,000 pesos (US\$35) a month plus 10 pesos (12 U.S. cents) per ton of fish in addition to room and board. Less experienced fishermen get the 10 pesos per ton but less salary.

As of March 1960, sabalo meal sold at 7 pesos a kilo (US\$84.70 a metric ton) f.o.b. Rio de la Plata plants. Sabalo oil varied from 10.50 to 17 pesos a kilo (5.7-9.1 U. S. cents a pound) f.o.b. plant.

In Buenos Aires, mixed-feed plants payed 140 pesos per unit of protein (US\$110 per tons of meal of 65 percent protein).

The fresh-water plants are limited to the amount of raw material they can receive each season, due to complaints from sport fishermen. As a consequence, the sabalo catch dropped from a peak of over 10,000 metric tons in 1948 to a low of 1,200 tons in 1951, but rose again to 6,300 tons in 1959. The 1960 catch will probably be lower than that of 1959.

The Government has given no particular aid to the fish-meal industry, but for fisheries in general they have permit-

## Argentina (Contd.):

ted new boats to be brought in without the 150 percent surcharge.

Fish meal and fish oil carry an export duty of 1.5 percent without retention of funds. Meat meal, which carries a higher duty, was being exported as fish meal, and export figures bear this out. Production for 1955 was less than 4,000 tons of fish meal whereas exports were reported to be more than 5,600 tons. Local consumption was between 1,500 and 4,000 tons for 1959.

Most of the fish oil is sold locally to tanneries with some going into local paint and other industrial uses.

No plant is presently using stickwater, although two will be equipped to add concentrated stickwater to the meal to make "whole meal."

A pilot plant, associated with a cannery and filleting plant in Mar del Plata, will produce enzymatically, a predigested fish and heat concentrate for human consumption. The plant, when in operation, will produce a final product which would be in the form of a concentrated paste, containing 60 percent products from fish scrap and the remaining a mixture of products from either beef, pork, soy bean, etc., depending upon the desires of the consumer.

The future of the Argentine fish meal industry appears to lie within the boundaries of Argentina. Her fishery resources of surface feeding and schooling fishes lie to the south where weather is difficult. There are large quantities of hake, but this means trawl caught as against purse seine-caught fish; the former method is more costly. Anchovies now taken for canning (and the scrap used for reduction) are presently caught by lampara nets and the catch is limited by available fishermen. Plants at Bahia Bustamante and Puerto Deseado cannot get fishermen to fish for them, as the Argentine fisherman fears greater catches and lower prices. Catches are generally regulated to demand.

Poultry raising has begun as a science and undoubtedly chicken will be more prevalent and less costly within the next few years—as a consequence local consumption of fish meal will increase. Practically no fish meal, other than for fertilizer, was used in Argentina about 4 or 5 years ago. Now, most of the local production of meal is going into mixtures for chicken feed. (United States Embassy, Mexico City, November 14, 1960.)



## Australia

### NEW SCALLOP BED FOUND OFF QUEENSLAND:

A new scallop bed was discovered at the beginning of September 1960 by Queensland shrimp trawlers over the Wide Bay bar off Tin Can Bay. In the rush that followed, 15 vessels, using heavy shrimp trawls, got big catches. The top vessel got about 12,000 pounds in 40 hours. There was not enough labor at Tin Can Bay to handle the scallops, and they were not allowed to be sent in shell elsewhere for opening because this was not considered advisable in warm weather. A-

bout three weeks later, only about 7 or 8 vessels were still working the scallop bed.

In 1956, a scallop ground was discovered off Bundaberg, and production increased from 50,000 pounds in 1955/56 to 1,200,000 pounds in 1956/57. But the next year it dropped to 44,200 pounds and in 1958/59 rose only to 51,244 pounds.

Scallop fishing in Queensland is basically a sideline to shrimp, and the fishermen, after the first flurry in 1956/57, probably went back to shrimp fishing. Handling and marketing difficulties also probably help to explain the drop in the landings of scallops. (Australian Fisheries Newsletter, November 1960.)

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### NEW SIZE LIMIT FOR SOUTH AUSTRALIA SPINY LOBSTERS:

The South Australian minimum length for spiny lobster,  *Jasus lalandii*, has been raised from 9 inches to 10 inches. This increase applies in all areas of the State except the Victor Harbour area, where the minimum length of 8 inches for male spiny lobsters is retained.

In addition, the closed season for females throughout the State has been extended to include June. The closed season will now be from June 1 to October 31.

In the Kangaroo Island fishery, the closed season for males, from July to October, has been extended to include June. In other words, in that area no fishing for either males or females can be done from June 1 to October 31. Spiny lobster production in South Australia during the past two years has decreased by approximately 20 percent each year, and the 1959/60 production of approximately 3.5 million pounds was the lowest since 1952/53. (Australian Fisheries Newsletter, November 1960.)

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### TUNA FISHERY TRENDS, FALL 1960:

Bad weather hindered tuna fishing off the Australian New South Wales coast since the beginning of September. The Australian cannery at Eden, which had received 220 short tons by September 1, 1960, had received only another 134 tons almost six weeks later. The fish were taken north of Eden, but to-

## Australia (Contd.):

wards mid-October they were concentrating in the Montague Island area.

To discuss the development of the tuna fishery on the New South Wales south coast, a conference was held on September 27, 1960.

It was generally agreed that the immediate need of the industry was larger refrigerated vessels to enable the fishing season to be extended and to stabilize the supply of fish to the canneries. Recent extensions to the Eden cannery have increased its intake capacity by 40 percent. It can now handle 6,500 tons of fish ("salmon" and tuna) a year.

Holding depots, possibly with brine tanks, at some of the tuna outports were also suggested. (Australian Fisheries Newsletter, November 1960.)



## Belgium

SHRIMP INDUSTRY:

Belgian shrimp landings consist of the small *Cragon vulgaris*, and are not sufficient to meet local demand, therefore, Belgian imports of shrimp, both peeled and unpeeled, exceed exports.

Consumption habits favor fresh shrimp, so there are no plants devoted exclusively to the processing of shrimp. A few fish canneries can shrimp as a side line, at Ostend and Denderleeuw. Peeled shrimp are imported from the Netherlands for this purpose as the price is lower due to a lower wage scale.

Exports of shrimp are neither aided by subsidies nor hindered by taxes but fluctuate depending on landings. France is the major buyer for the decreasing exports of shrimp. Exports to the United States are insignificant.

Fishermen's wages vary between US\$1,500 to \$4,000 annually, depending on function. Wage rates in canneries run from an average of 44 U. S. cents per hour for women to 56 U. S. cents per hour for men, social security costs included.

No increases in production or exports are anticipated in the near future.

During 1959, 115 small vessels were engaged in shrimp fishing and another 74 mainly in catching groundfish, but also taking appreciable quantities of shrimp. This involved 482 fishermen, including 78 vessel owners. The shrimp vessels have an average displacement of from 5 to 28 tons with motor power averaging from 15 to 79 hp. The groundfish trawlers displaced 19-57 tons with 80-119 hp. engines. The shrimp catch accounted for 2.3 percent of total landings of fishery products in Belgium, and 6.1 percent of the value. Ostend and Nieuport are the principal Belgian shrimp fishing ports.

Belgian shrimp fishing grounds are along the coast within 12 miles. They extend from an imaginary line from Gris Nez-South Foreland, in the south, to the parallel of Ijmuiden, in the north.

Shrimp are caught throughout the year, with maximum landings recorded from April to July. These months account for half the total annual landings. December, January, and February each yield below 4 percent of the annual catch.

Belgian shrimp are cooked aboard the vessel.

Year	Quantity 1,000 Lbs.	Value US\$,1,000
1960/1/ . . .	1,011	451
1959 . . . .	2,365	600
1958 . . . .	1,687	429
1957 . . . .	2,214	743
1956 . . . .	7,039	1,460
1/Estimate for first 8 months only.		

of which have been operating with losses, will decrease steadily. Replacement will be by larger deep-sea vessels.

Year	Unpeeled	Peeled
	. . . (US\$ Per Lb.) . . .	
1960/1/ . . . .	74	117
1959 . . . . .	26	80
1958 . . . . .	28	88
1957 . . . . .	49	107
1/Average for first 7 months.		

on shrimp; however, an export license is required. Subsidies are not granted for the exportation of shrimp.

Since there are no plants specializing in the processing of shrimp, general cannery rates apply to personnel handling shrimp.

There are no plans for additions to the present shrimp fleet. It is expected that the number of ves-

sels, many of which have been operating with losses, will decrease steadily. Replacement will be by larger deep-sea vessels.

boats and trawlers belong to Belgian owners, many to their operators.

No export tax is levied

## Belgium (Contd.):

The average salary per hour for peeling shrimp, including social security charges, is US\$0.44 for female workers. An expert can peel approximately 2.2 pounds per hour. The wage rate for men working in the fish canneries averages 28 B. fr. (US\$0.56) per hour, including social security charges. These wage rates are below the national average.

In general, payment consists of cash, a pay in kind, and certain social security coverage. The crews of deep-sea trawlers get a fixed monthly salary in addition to a percentage of the production; the fishermen on shrimp boats and coastal trawlers receive a fixed share of the catch. After each voyage the crew receives, in pay, a fixed percentage of the gross receipts.

Table 3 - Belgian Shrimp Exports, 1956-1960

Year	Unpeeled		Peeled	
	Quantity	Value	Quantity	Value
	1,000 Lbs.	US\$1,000	1,000 Lbs.	US\$1,000
1960/1 . . . . .	35	19	11	10
1959 . . . . .	171	44	31	24
1958 . . . . .	172	47	18	16
1957 . . . . .	425	211	17	19
1956 . . . . .	2,121	596	52	33

1/January-August only.

Note: About 91 percent of unpeeled exports go to France, the remainder to the Netherlands; about 70 percent of peeled shrimp went to the Congo; 27 percent to France; and the balance to the Netherlands. (Exports to the Congo are expected to decrease.) The decline in total exports from 1956 through 1960 was due to decreased landings.

In addition to pay in cash, fishermen receive a portion of the catch for their own consumption. Other advantages include paid annual leave and compensation for holidays.

The Belgian shrimp grounds are fished thoroughly. Nevertheless, during recent years the total landings of shrimp have shown a marked downward trend, except for a revival during 1959 when weather conditions were extremely favorable.

In 1960 there was surplus capacity in the shrimp fishing fleet. Only favorable weather can increase the shrimp catch--500 tons were anticipated in 1960, a sharp decline from the 3,193 tons of 1956. Normally Belgian consumption averages 2,000 tons a year.

Belgian exports of shrimp to the United States are practically nil and will remain so. (United States Consulate, Antwerp, November 16, 1960.)



## Brazil

## SHRIMP INDUSTRY:

Landings of shrimp in Brazil during 1960 were estimated to be about 24,427 metric tons valued at about US\$3.4 million. This amount represents an increase of 24.9 percent over the 19,558 tons landed in 1959, and 31.6 percent above the 18,558 tons landed in 1958.

Shrimp exports by Brazil are negligible and processing facilities as of late 1960 were still rudimentary. Exports of fresh or frozen shrimp in 1959 amounted to about

Region	1960/			1959/			1958		
	Quantity	Value		Quantity	Value		Quantity	Value	
	Metric Tons	1,000	US\$	Metric Tons	1,000	US\$	Metric Tons	1,000	US\$
North . . . . .	1,384	160,000	825	799	14,508	71	810	10,785	78
Northeast . . . . .	19,000	170,000	876	6,403	143,856	706	6,513	131,097	948
East . . . . .	3,980	190,000	928	3,362	261,002	1,285	2,519	135,251	1,000
Total . . . . .	24,427	680,000	3,402	19,558	694,108	3,408	18,558	434,483	3,137

(Metric Tons)  
Note: Currency converted at following rates: 1960, Cr. 194.0 equal US\$1; 1959, Cr. 203.8 equal US\$1; and 1958, Cr. 138.5 equal US\$1.

16,700 pounds, dried or cured shrimp about 25,000 pounds, and canned shrimp about 31,000 pounds. From January to June 1960, Brazil exported only canned shrimp--1,620 pounds valued at about 63.5 U. S. cents a pound. Only two species (sea bob or *Xiphopus kroyeri* and small white shrimp or *Penaeus schmettei*) were exported in 1959.

Table 2 - Brazil's Shrimp Exports, 1959

Product and Destination	Quantity Pounds	Value	
		Cruzeiros	US\$
<b>Shrimp, fresh, chilled, or frozen:</b>			
United States . . . . .	1,349	103,236	737
Others . . . . .	15,373	1,333,404	9,286
Total . . . . .	16,722	1,436,640	10,023
<b>Shrimp, dried, salted, or in brine:</b>			
Other countries . . . . .	25,152	2,110,163	13,137
<b>Shrimp in air-tight containers:</b>			
United States . . . . .	18,157	2,475,178	17,070
Others . . . . .	12,749	1,150,738	8,714
Total . . . . .	30,906	3,625,916	25,784

Most of the shrimp frozen in Brazil are sold peeled, some of which are peeled prior to cooking. Ten shrimp-fishing vessels operated out of Brazilian ports in 1960--7 out of Rio de Janeiro and 3 of United States registry out of Maranhao. Vessels or small boats engaged in other fisheries also catch and land shrimp.

Wages are paid for peeling shrimp on a piecework basis of 1.8 to 2.2 U. S. cents a



## Brazil (Contd.):

Wages for those engaged in the freezing of shrimp range between US\$37 to \$41 per month.

The daily catch of fish and shellfish in Brazil is sold to fish-receiving centers. One-tenth of the proceeds, after expenses are deducted, goes to the Institute of Retirement and Pensions for Maritime workers, and the remainder is divided among the vessel owners and crew.

In view of Brazil's known shrimp-fishing potential, there is little doubt that landings will increase with improved fishing vessels and gear and storage and processing facilities. However, it is believed that the major part of the increase in landings will be consumed in the domestic market. (U. S. Embassy, Rio de Janeiro, November 29, 1960.)



## British Guiana

### SHRIMP INDUSTRY:

The shrimp fishermen who operate out of British Guiana's Georgetown harbor had a very prosperous 1960. Their total shrimp catch will exceed 2.5 million pounds (heads-on), more than double 1959 landings. More shrimp trawlers are now based in British Guiana than ever before in the Colony's history, and the prospects are for more trawlers, higher shrimp production, and even bigger profits in 1961.

The growth and prosperity of the British Guiana shrimp industry during 1960 was about as expected. What has failed to materialize, or more accurately, what is taking place more slowly than anticipated, is the entrance of Guianese firms in to the shrimp industry.

As of now, the shrimp industry remains an almost exclusive preserve of a United States-owned and operated firm. This monopoly, however, is about to be broken by a subsidiary of the largest private business concern in British Guiana. This firm, after months of study, is about to begin shrimp fishing on a trial basis in conjunction with several United States shrimp vessel owners. The performance of these vessels and a possibility of United States shrimp import quotas will influence the firm's final decision to enter the shrimp fishery early in 1961. Specifically, it will decide whether or not to build a freezing plant and to build waterfront accommodations for a large number of new trawlers.

Actually, such facilities are badly needed if the industry is to expand in 1961. The United States-owned firm, which increased its fleet from 20 to 32 vessels during 1960, has about run out of wharf space. Its freezing plant is now working at near capacity, 25,000 pounds per day. While the company did purchase some waterfront land about six miles up the Demerara River during 1960, it apparently has no immediate plans for enlarging its freezing plant--the only one now in British Guiana--or expanding its trawler operations.

The Georgetown fishing company reports that the best fishing grounds are now located about 70 miles off the coast of Surinam. These grounds are worked the year around, and there seems to be no seasonal variation in production. Current catches are running about 80 percent pink shrimp (*Peneaus duorarum*) and 20 percent brown shrimp (*Peneaus aztecus*). These varieties are caught together and are not separated in processing.

Trawlers leaving Georgetown spend about four weeks fishing off the Surinam coast and, in recent months, have been returning home with an average shrimp catch of 7,000 pounds. Each of these trawlers carries a crew of four. In addition to a United States captain, there is usually an American winch-operator and two Guianese crew men. The Americans are paid a percentage of the catch, while the Guianese fishermen earn about US\$20.65 a week.

When the trawlers return, the shrimp are immediately unloaded at the freezing plant. The plant is equipped with a shrimp-grading machine, and after being graded, the shrimp are cleaned and packed into 5-pound paper cartons and in turn packed into master cartons of 50 pounds. All this processing is now done by hand, and the company has no immediate plans for mechanization. Wage rates paid in the processing plant, according to the Georgetown fishing company, average about 27 U. S. cents an hour.

About 98 percent of the packaged frozen shrimp is eventually exported. Most of the shrimp goes to the United States, either by air cargo or steamship reefer service. On each shipment the British Guiana Government usually collects an export tax amounting to 1½ percent of the total value of the shrimp.

Shrimp (heads on) landings in British Guiana (data from the shrimp processing and freezing firm and other sources) during 1960 were estimated to be 2.6 million pounds valued at US\$1 million, as compared with about 1.2 million pounds valued at US\$475,000 in 1959. Prior to 1959 shrimp landings amounted to less than 10,000 pounds annually.

Exports were as follows: 1960: United States, 1,210,148 pounds valued at US\$462,081; Trinidad, 39,400 pounds valued at US\$2,162; and the United Kingdom, 2,000 pounds valued at US\$1,294. 1959: United States, 1,131,720 pounds valued at US\$433,018; and Trinidad, 8,846 pounds valued at US\$5,008. (United States Consul in Georgetown, December 5, 1960.)



## Burma

### SHRIMP INDUSTRY:

Shrimp fishing in Burma is carried on along the coastal regions, and in the lower Irrawaddy Delta. Kyauppyu Island, Ye Township, and Mergui and Pyapon Districts are the large-scale fishing and processing centers. Coastal shrimp fishing is carried on mainly during the dry season (November-May) due to the rough seas during the rains. The heavy run-off of rain water from the coastal areas over the shallow sea shelf drives the shrimp out to sea during the rainy season. Delta fishing is carried on in the rainy season only.

Shrimp are caught with various kinds of gear made of twine, split-bamboo, wooden logs, and poles. The principal types of gear are the hand net, bag net, fish trap, and floating raft with a net fixed on each side. Fishing gear is licensed and taxed by the Government.

Fishing grounds are leased by the Government, and are auctioned annually. Leases entitle one man his assignee to operate. The lessee of a large area with an annual rental of Kyats 1,500 to 2,000 (US\$314-\$419) will frequently sub-

## Burma (Contd.):

divide it and sublease to individuals or groups of fishermen. Not infrequently, the sublessees are compelled to borrow money from fish dealers and brokers to whom they are required to supply the entire catch at rates far below the normal market prices.

A fisherman is paid an average of Kyats 50 (US\$10.50) per month during the fishing season with free food. A processing laborer's wages are similar to an ordinary laborer--32 to 75 U.S. cents per day.

Processed shrimp are mainly of three kinds: sun-dried, after boiling; smoked; or ground into paste and preserved with salt (called ngapi). A byproduct of ngapi is Nganyya-Ye (shrimp sauce) which is the juice from ngapi collected separately. Shrimp "brains" are preserved in seshamum or groundnut oil, and sold as shrimp oil.

Retail prices of sun-dried shrimp range from Kyats 12-18 per viss, 3.6 pounds (US\$0.70 to \$1.05 per lb.), according to quality; smoked shrimp Kyats 8 to 9 per viss (US\$0.47 to \$0.53 a lb.) for inferior quality and Kyats 14 to 18 per viss (US\$0.81 to \$1.05 per lb.) for superior quality; and shrimp paste Kyats 3 to 5 per viss (US\$0.18 to \$0.29 per lb.). Price of shrimp sauce is about Kyats 3.50 per viss (US\$0.26 per lb.), and shrimp oil Kyats 10 per viss (US\$0.58 per lb.).

In Burma, shrimp and shrimp products are very popular and a staple part of the diet.

Fishing is done in the districts of Akyab, Kyaukpyu, and Sandaway in the coastal region of the Arakan division; Mergu, Tavoy, and Ye Township of the coastal region of the Tenasserim division; and the coastal as well as delta tracts of Bassein, Myaungmya, and Pyanon districts in the Irrawaddy division. In the delta areas, traps are set in the lower reaches and above the mouths of the tidal creeks, where the water is brackish in the dry season, but relatively fresh during the rains. Sea fishing is carried on close to the estuary islands.

In the upper tidal zone, fishing goes on from June to September, and in the lower zone from July to November. The peak season is during July and August. Fishing is generally done for 12 to 14 days a month when the tidal current is strong. Along the coastal region the operation is intensively carried on in dry season, though there may be irregular fishing during the rains.

Primitive methods are still used for processing shrimp on a large scale. They are boiled and dried in the sun. When sun is lacking, the shrimp are smoked over a fire. Fresh shrimp is pounded into paste (ngapi) and then preserved with salt. Labor being cheap, the need for mechanization has not yet been felt.

Shrimp paste processing has been mechanized recently to a small extent. Motor mincers for grinding raw shrimp are used. The motors are run by gasoline or electrical power. Other operations are performed manually.

The Burmese Government's Union of Burma Applied Research Institute is carrying out studies of improving food preservation, canning, and processing, with the assistance of a Food and Agricultural Organization (FAO) food processing and hygiene expert. The establishment of standards and specifications for the manufacture of shrimp paste is to be the first step taken in food standardization in Burma. A commercial type of standard fish-drying chamber has been designed, and is being tested, which may be usable for shrimp. According to the FAO expert, small-scale shrimp canning plants with a daily output of 300 to 500 cans would prove to be profitable.

No statistics are available for shrimp landings; however, the following estimates for heads-on shrimp have been

made after consultation with the agencies concerned: 1960, 6,700 metric tons; and 1959 5,200 tons; 1958, 6,600 tons; 1957, 6,500 tons; and 1956, 6,400 tons.

The shrimp catch consists mainly of Pa-zun-zait ( $\frac{1}{2}$ -inch), Pa-zun-kyawt (1 inch to 2 inches), Pa-zun-gya (3 inches to 4 inches), and Pa-zun-dok (5 inches to 9 inches) shrimp. Shrimp paste and dried shrimp are usually made with the first two sizes.

No trawlers are used for shrimp fishing. Local craft (dugouts, and plank-boats made of timber) are operated for both sea fishing and river fishing. Country craft are owned by the fishermen themselves. Motors of the transport craft are imported generally from the United Kingdom, India, Japan, or Germany. As of November 1960 no vessel construction program existed, and shrimp was not exported.

Export of fish and fish products including shrimp is permissible under the Control of Imports and Exports (Temporary) Act 1947 as amended and still in force. Permission is needed from the Directorate of Imports and Exports. To qualify for export, an exporter must register with the Importers and Exporters Registration Board. Only Burmese nationals are registered as exporters. Exporters are required to submit application with Kyats 3 (about 63 U. S. cents) court-fee stamp affixed to the Directorate. There is no export duty on shrimp or shrimp products.

Basis of payment to fishermen varies with the type of organization. A cooperative fishery obtains a lease for a fishery area from the Government at a reduced rental (about half that usually charged to a private individual or organization) and pays fishermen better wages: K80 to K100 (US\$16.80 to \$21.00) a month for unskilled labor, and K120 (US\$25.20) a month for skilled labor. In addition, cooperative fishermen receive a share of annual profits. A private lessee can afford to pay only much lower wages: K45 to 60 (US\$9.50 to \$12.60) a month. When a person obtains a lease in his own village circle, he generally induces his relatives and friends to work for him for payment of food and clothing and a nominal sum of money.

Shrimp are not raised artificially at present in Burma except in a 55-acre artificial lake on Kyaukpyu Island, where attempts are being made to cultivate shrimp. Mechanizing fishing operations could increase production. Lack of knowledge, capital, and enterprise seem to be major deterrents to such actions.

Some years ago, the Government advanced loans to the fishermen to improve their fishing gear and fishery grounds, so that production might be increased. The loan amounted to K300,000 (US\$63,000) advanced at 6-1/4 percent interest per annum on a three-year term. The fishermen lost most of the capital on personal expenditures, and in settling old debts. The outstanding loans now stand at K350,000 with interest. The Government has stopped lending, and the fishermen are carrying on in primitive ways.

Fishermen traditionally borrow from private money lenders, who may be fish brokers or processing men, at rates of interest of 10 to 20 percent per month. The reason for preferring private money lenders to the Government, in spite of the high interest rate, is that the former will defer repayment indefinitely, while deducting the interest from the seasonal catch, whereas the Government's loan must be repaid within a fixed period.

Substantial possibilities exist for improving the shrimp fishing industry, but organization, finance, and knowledge of modern techniques are lacking. It will be some years before Burma can adequately supply its domestic needs for shrimp, much less have an exportable surplus. (U.S. Embassy, Rangoon, November 17, 1960.)

Note: Currency converted at rate of one Kyat equals US\$0.2096.

## Canada

### BRITISH COLUMBIA HERRING FLEET ENDS LONG TIE-UP:

The British Columbia herring fleet resumed fishing on November 20, 1960, after being idle for almost a year as a result of differences between the fishing companies and the fishermen's union over the ex-vessel price. British Columbia's herring fishery shut down in December 1959 as a result of depression prices in world markets for fish meal and oil.

The companies' offer, which was accepted by a union vote of two to one, agreed to pay the crew of each herring vessel C\$8.80 a ton, or \$1.10 each for an 8-man crew. In 1959 the boat share was \$13.00 or \$1.04 each for 8 fishermen and 5 tendermen. Under the new plan the jobs of the tendermen have been eliminated and individual fishermen are required to carry their catch to the shore plants. The settlement restored the jobs of 800 herring fishermen. However, the elimination of the 300 tendermen who previously worked the company-owned transport vessels used to transport raw herring to the processing plants has resulted in a cut in the cost of the fish to the companies from \$13.00 to \$8.60 a ton. The new agreement requires the fishing vessels to transport catches to the processing plants, which will either result in less time on the fishing grounds for the individual vessels or require that they travel to the processing plants at night when they would otherwise be tied up.

The union has insisted that the fishing fleet be restricted to 78 vessels to ensure a reasonable return to the fishermen during the 5-months season. The fishing vessel owners' association has opposed the 78-boat limit but has been unable to put additional boats in the fishery since they could not get charters from the six processing companies. The processing companies contend, in turn, that if they were to give additional charters in excess of the 78-boat limit, the union would then reopen negotiations. (U. S. Consul, Vancouver, December 2, 1960.)

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### BRITISH COLUMBIA'S SHRIMP INDUSTRY:

The Canadian shrimp fishery, which is concentrated in British Columbia, is one of Canada's minor fisheries. Average landings for the 4-year period 1956-59 were slightly under 1.5 million pounds of heads-on shrimp.

The ex-vessel value was slightly over C\$230,000 annually, averaged over the four years. Most of the catch (80-85 percent) is marketed in the form of peeled shrimp, either fresh or frozen, and the 4-year average marketed value was about \$380,000 annually.

Approximately 90 percent of the annual catch is taken from specific grounds located in the Gulf of Georgia. About 15 small-type boats of the 35- to 40-foot class fish all year round and about another 50 salmon gill-net boats turn to shrimp trawling during the off-season for salmon fishing.

There are about four major cooperative groups which land most of the catch. The shrimp are usually landed heads-on and about 75 women do the cooking and peeling ashore. Nearly all of these workers are Japanese Canadians, related to the fishermen. Ex-vessel prices range between \$0.90-1.10 per pound for the meat, or 12 to 15 Canadian cents a pound for the heads-on shrimp. Recovery is estimated at one pound of peeled shrimp for 4½ pounds of whole shrimp.

Some of the fishermen working individually do the cooking on board their boat and peeling is done again by the family, after landing the catch. Shrimp are canned in British Columbia.

As far as mechanization is concerned, all picking is done by hand as no one group's operation is large enough to warrant a mechanical picker. Also, the hand operation is believed to yield a superior peeled shrimp product.

There are no known export controls, subsidies, or taxes on export of shrimp to the United States, according to shellfish handlers in Vancouver. It is understood, however, that affidavits are necessary stating the product is of Canadian origin.

Owing to the cooperative working nature of the fishermen producing shrimp, there are no established wage rates. Fishermen fishing for shrimp year-round might gross about \$5,000, and earnings of seasonal fishermen vary from a few dollars to \$2,000.

While exploratory work was done in 1955 to find new shrimp fishing grounds, landings have increased only about one-third since then, still remaining a relatively small operation. No sizable expansion in production can be

Canada (Contd.):

predicted, if at all. (U. S. Embassy, Ottawa, November 7, 1960.)



## Colombia

### SHRIMP FISHING INDUSTRY:

The shrimp fishery of Colombia has in the past played a minor part in the economy of Colombia, and prospects are slim for it to play a much greater role in the future. According to an official of the Fishing and Hunting Department of the Ministry of Agriculture, Colombians have never displayed any serious interest in a large-scale shrimp fishery, and even today, they are content to permit foreign-flag operators to engage in these activities along their shores. Almost all of the shrimp vessels fishing Colombia's offshore waters are owned, operated, and officered by United States citizens or other foreigners.

Shrimp fishing for export from Colombia is confined to the Pacific coastal areas from Tumaco on the Ecuadorian border northward to Bahía Solano, although very little activity is reported to the north of Buenaventura. Shrimp are available in commercial quantities year-round, but the months of December and January yield smaller catches than the other months of the year.

The Atlantic coastal areas produce no shrimp for export; however the species *Penaeus schmitti* and *P. brasiliensis* are taken in limited quantities for the domestic market. Current production statistics are not available, but according to a 1956 survey, the estimated annual catch for the Atlantic region ranges between 600,000 and 1,000,000 pounds (heads-on weight) with little prospects for increasing.

Table 1 - Colombia's Shrimp Landings and Exports, 1957-60

Year	Landings <sup>2/</sup>			Exports <sup>2/</sup>		
	Qty.	Value <sup>3/</sup>		Qty.	Value <sup>3/</sup>	
	1,000 Lbs.	Million Pesos	US\$ 1,000	1,000 Lbs.	Million Pesos	US\$ 1,000
1960 <sup>1/</sup>	3,911	14.2	2,119	2,557	10.7	1,599
1959	3,020	11.8	1,847	2,050	8.5	1,336
1958	1,522	4.4	612	899	2.8	388
1957	513	1.1	191	135	1.1	47

<sup>1/</sup> Estimated.

<sup>2/</sup> Heads-off.

<sup>3/</sup> Pesos converted to US\$ at following rates: 1957, 5.97 pesos; 1958, 7.22 pesos; 1959, 6.40 pesos; and 1960, 6.75 pesos equal US\$1.

Compared with these figures, the Pacific fishing grounds are estimated to have a potential of between 3-6 million pounds of the large shrimp varieties, and the same potential for the smaller sizes. In view of the foregoing, the Pacific areas may be considered as the sole sources of supply for shrimp that enter into the export market. Colombia's sole customer for its export shrimp today is the United States.

On the Atlantic Coast, shrimp processing is normally combined with other fisheries. There are four fish-canning plants and one fish-freezing plant at Barranquilla, one fish-canning plant at Santa Marta, and one fish-canning plant at La Ciénega. A small quantity of shrimp is frozen at the plant in Barranquilla for local consumption, but the majority of the shrimp catch from the area of the Atlantic Coast is canned for sale throughout Colombia.

A trial shipment of breaded shrimp was exported to the United States from Colombia during 1959, but further shipments are being delayed until a study of the market has been made.

There are from 70 to 80 large shrimp vessels operating year-around along the Colombian Pacific Coast and about 40 small boats and dugouts operating in the Atlantic coastal region.

Colombia does not have an official vessel construction program to assist the shrimp industry, and it is doubtful that any such program will be initiated in the near future. By decree during 1959, the Colombian Government limited the licensing and operation of shrimp vessels to a maximum of 100 in the Pacific area, and the same number in the Atlantic. These licenses are valid for only one year, with the licensee prohibited from engaging in shrimp fishing outside of Colombian waters during that period.

In the Pacific fishing grounds, it is believed that about 75 percent of all vessels licensed are of Panamanian registry, with about one-half of those owned by United States citizens. The balance of 25 percent are Colombian-registered, but only one-half of those are Colombian-owned. Other nationalities, including an Italian, a Yugoslav, and a Portuguese, account for the ownership of the other half.

According to private and Government sources, export prices range from 75 to 83 U. S. cents a pound, heads-off, delivered c.i.f. New York for packaged frozen shrimp. The higher prices are for shrimp of under 15 count per pound. These prices are held stable throughout the year by controlling the supplies that enter the export market.

The Government controls exports of shrimp to the extent that a license must be obtained by the exporter from the Instituto de Fomento Industrial. This license must then be presented to the Banco de la Republica, which registers the foreign exchange transaction. When the shipment is ready at the port of embarkation, the Administración de Aduana (Customs) checks all documents for completeness and accuracy, then a custom's agent oversees the loading aboard a vessel.

Small companies without processing plants of their own are charged 15 U. S. cents a pound for the freezing and packaging of shrimp by the larger companies. Therefore, it is believed that a figure of about 10 to 12 cents a pound would approximate the deveining, peeling, and freezing cost.

The vessels are paid at the rate of 40-45 U. S. cents a pound, heads-off weight.

It is believed by observers that shrimp plants in Colombia are interested in expanding the catch and exports of a small shrimp called "titi" for the United States market. These small-sized shrimp are taken from the waters near Tumaco, and apparently the catch is increasing due to the substantial market that has been developing on the United States east coast.

The normal white varieties of shrimp are still being captured in commercial quantities, but it is believed their importance will diminish in proportion to the increase in popularity of the small shrimp or "titi."

Germany has expressed an interest in importing Colombian shrimp, according to several sources, and it is quite possible that exports of large white shrimp will shift to that country, while the United States importers expand the market for the small variety. (United States Embassy in Bogota, December 2, 1960.)



## Cuba

### FISHING INDUSTRY TRENDS, DECEMBER 1960:

An article in the Cuban newspaper El Mundo, December 2, 1960, states that workers in the shipyards of Puerto Esperanza, Pinar del Rio Province, and Surgidero de Batabano, Habana Province, had "agreed" to work 48 hours a week instead of the usual 44, without additional compensation for the purpose of speeding up the completion of the "Sigma" fishing vessels. "This gesture of a revolutionary nature will be followed by workers in all the remaining shipyards," the article noted.

A people's fish market opened at Ciudad Bandera, Cardenas, Matanzas Province, and shortly its Fish Cooperative will complete the preparations in different sections of the city for opening fish and seafood markets. According to the article this made a total of 60 fish cooperatives functioning throughout the Island.

The installation of a refrigerating unit with a 35,000-pound capacity in the Guatemala Sugar Mill (formerly Preston), the manufacture of fish and seafood packing boxes on the banks of the Almendares River, and the near completion of two refrigerator-trucks for the transport of fish from coastal towns to the city of Habana are also referred to in the article.



## East Africa

### FISHING POTENTIAL DISCUSSED AT INTERNATIONAL SYMPOSIUM:

The largely unexploited fishery resources of East African waters were the subject of an International symposium held in Cape Town from September 12 to September 17, 1960.

Convened under the auspices of the Commission for Technical Cooperation in Africa, South of the Sahara (C.C.T.A.), the Symposium was attended by delegates representing most of the African continental and nearby island territories fishing in the Indian Ocean. There were delegates from Madagascar, Portugal, Union of South Africa, and observers from Italy and FAO.

It was pointed out that it was particularly important for the countries of Africa to gain

extensive knowledge of the exploited and exploitable marine food resources occurring in the seas bordering their coasts.

According to the latest published statistics of FAO, the world catch of marine fauna in 1957 totaled 26½ million metric tons, of which 1.6 million tons, or 6 percent, were landed in Africa, south of the Sahara.

The catch in the Indian Ocean region was only about one-twelfth of the landings along the African west coast. But although west coast waters had been very much more productive, there could be very little doubt that the Indian Ocean--described by oceanographers as one of the least known oceans of the world--could yield a substantially larger fish catch. Research, however, was necessary to point the way.

The symposium emphasized the need for international coordination of Indian Ocean research work already done at a national level. The symposium was indicated as one means of achieving this. Another would be the "great scientific onslaught that is scheduled in the Indian Ocean during the next few years, when the ambitious project, initiated by the Special Committee for Oceanic Research (S.C.O.R.) of the International Council of Scientific Unions gets under way. At an estimated cost of US\$13½ million, this project will be jointly executed by ten countries, namely, Australia, Denmark, France, Germany, Great Britain, India, Japan, South Africa, the United States, and Russia. Portugal and other countries, now forming national committees, may also announce plans to participate. The program is not expected to be in full swing until 1962-63."

The symposium was divided into 6 or 7 sessions in which various aspects of the East African region of the Indian Ocean were discussed. The subject of the first session was the physical and biological environment of the area, which, for the purpose of the symposium extended from Cape Point to Somalia. The following session on research work done by the countries represented revealed that some research stations had done interesting work in experimental fishing, particularly for shrimp. Other efforts had been made to develop tuna fishing, and representatives from South Africa mentioned recent attempts to use a mid-water trawl in Union east coast waters.

The third and fourth sessions dealt with fish, lobster, shrimp, and plankton; and the

## East Africa (Contd.):

fifth session discussed the productivity of the Indian Ocean, the methods of determining this, and the extent of commercial fisheries in East African waters.

The sixth session was devoted to an inventory of regional resources for marine biological and sea fishery research. The question of international cooperation was also discussed and delegates considered the role that should be played by C.C.T.A. It was generally agreed at the Symposium that the recent appointment by C.C.T.A. of an Inter-African Coordinator would stimulate and assist interterritorial cooperation. At the final session resolutions and recommendations were discussed. Among the recommendations was one emphasizing the need to increase the size and the number of research establishments in the East African area of the Indian Ocean. It was also felt that special steps should be taken to train more scientists for work in the area. Other recommendations of the Symposium included:

A greater exchange of scientists among countries interested in the fishing waters off East Africa.

The shrimp resource could be better exploited if more was known about movements and general biology. Special attention should be paid to a study of this resource.

A coordinated, systematic study of tuna in the area.

A bibliography of all research reports and other scientific information on the African zone of the Indian Ocean should be drawn up in collaboration with the C.C.T.A.

A permanent secretariat should be established to help coordinate research work in the area. (The South African Shipping News and Fishing Industry Review, October 1960.)



## Egypt

## FOREIGN TRADE IN FISHERY PRODUCTS, 1958-60:

Imports: Egyptian imports of fishery products increased from 5,423 metric tons valued at US\$1.8 million in 1958 to 6,595 tons valued at US\$2.2 million in 1959. Imports

Table 1 - Egyptian Imports of Fishery Products by Type, Quantity, and Value, 1958-1960

Item	1959			1958			Jan.-June 1960			Jan.-June 1959		
	Quantity Metric Tons	Value EL	Value US\$	Quantity Metric Tons	Value EL	Value US\$	Quantity Metric Tons	Value EL	Value US\$	Quantity Metric Tons	Value EL	Value US\$
Fresh Fish												
Cod, salted, dried, or smoked	46	3,907	11,088	115	9,496	26,350	17	15	43	7	717	2,035
Salted herrings, dried or smoked	-	-	-	903	96,935	275,102	-	-	-	-	-	-
Sardines, salted, dried, or smoked	598	56,718	160,966	1,088	86,785	246,296	1,075	85,162	241,690	520	50,005	141,914
Crustaceans, fresh, salted or cooked	401	25,531	72,457	336	21,712	61,619	170	11,804	33,500	356	22,355	63,443
Fish, salted, dried, or smoked, n.s.	1/	60	170	-	-	-	-	-	-	-	-	-
Black caviar in containers up to 1 lb. 2 oz.	839	48,442	137,478	559	36,425	103,374	169	8,637	24,512	504	30,610	86,871
Black caviar in containers over 1 lb. 2 oz.	1/	319	905	1/	158	448	-	-	-	1/	319	905
Edible fish eggs	1/	153	434	1/	67	180	1/	60	170	1/	80	227
Botargo in containers up to 1 lb. 2 oz.	1/	8	23	2	614	1,748	-	-	-	1/	8	23
Botargo in containers over 1 lb. 2 oz.	1/	130	369	1/	556	1,578	-	-	-	-	-	-
Preserved salmon, canned	1/	10	28	1/	24	68	-	-	-	-	-	-
Preserved sardines, canned	9	3,019	8,568	1	200	568	1	405	1,149	7	2,416	6,857
Preserved tuna, canned	378	72,247	205,037	381	90,605	257,137	331	61,257	173,847	187	38,244	108,536
Preserved fish, n.s., and anchovies and herrings, canned	528	121,291	344,224	183	53,915	153,011	181	39,587	112,348	214	44,863	127,321
Preserved crustaceans, canned	3,739	429,579	1,219,145	1,849	241,493	685,356	2,227	270,329	767,194	2,318	250,378	710,573
Preserved mollusks, canned	57	7,514	21,325	1	184	522	8	1,708	4,847	1/	143	406
Total Imports	1/	113	321	-	-	-	-	-	-	1/	113	321
	6,595	769,041	2,182,538	5,423	635,080	1,802,357	4,162	478,964	1,359,300	4,113	440,251	1,249,432

1/ Less than 1,102 lbs.

N.S. - Not Specified.

Note: Values converted at rate of £1 equals US\$2.338.

Egypt (Contd.):

Table 2 - Egyptian Imports of Fishery Products from the United States, 1959

Item	Value	
	EL	US\$
Shellfish, fresh, salted, or cooked ..	60	170
Caviar, black .....	304	863
Salmon, canned .....	132	75
Sardines, canned .....	59	167
Tuna, canned .....	69	196
Anchovies, herrings & unspecified fish, canned .....	64	182
Crustaceans, canned .....	14	40
Mollusks, canned .....	86	244
Total .....	788	1,937

for the first six months of 1960 were slightly higher than in the first half of 1959. Imports of salted, dried, or smoked herring, and canned sardines increased considerably, while imports of salted, dried, or smoked sardines and other fish declined (table 1). Since 1957 there has been a steady drop in Egyptian imports of fishery products, but exports have increased. Egypt's imports of fishery products from the United States are of minor importance (table 2).

**Exports:** Total exports of fishery products from Egypt increased from 957 tons valued at US\$702,053 in 1958 to 1,317 tons valued at US\$1,308,043 in 1959. The increase was for virtually all products. However, this did not continue into 1960. Exports for the

Table 3 - Egyptian Exports of Fishery Products by Type, Quantity and Value, 1958-1960, as Specified

Item	1959			1958			Jan.-June 1960			Jan.-June 1959		
	Quantity Metric Tons	Value		Quantity Metric Tons	Value		Quantity Metric Tons	Value		Quantity Metric Tons	Value	
		EL	US\$		EL	US\$		EL	US\$		EL	US\$
<b>Regular Exports:</b>												
Fresh fish .....	205	36,802	104,444	185	30,044	85,265	79	15,218	43,189	110	19,089	54,175
Sardines, salted, dried, or smoked .....	2	176	499	7	439	1,246	1/	7	20	1/	28	79
Fish, salted, dried, or smoked .....	72	6,707	19,034	70	5,968	16,937	39	4,070	11,550	56	5,065	14,374
Crustaceans, fresh, salted, or cooked .....	233	42,690	121,155	176	24,509	69,556	-	-	-	100	15,070	42,769
Mollusks, fresh, salted, or cooked .....	1/	4	11	1/	1	3	1/	4	11	-	-	-
Turtles, fresh, salted, or cooked .....	1/	235	667	1/	254	721	1/	132	375	1/	30	85
Preserved crustaceans not in airtight containers. Botargo in containers over 1 lb. 2 oz. ....	1/	3	-	-	-	-	-	-	-	-	-	-
Preserved shrimp not in airtight containers <sup>2/</sup> .....	-	-	-	-	-	-	511	203,938	578,776	-	-	-
<b>Total Exports<sup>3/</sup> .....</b>	<b>1,317</b>	<b>460,903</b>	<b>1,308,043</b>	<b>957</b>	<b>247,376</b>	<b>702,053</b>	<b>829</b>	<b>223,369</b>	<b>633,921</b>	<b>839</b>	<b>310,116</b>	<b>880,109</b>
<b>Re-exports:</b>												
Herrings, salted, dried, or smoked, .....	1/	9	26	1/	26	74	-	-	-	-	-	-
Preserved salmon in airtight containers .....	1	200	568	-	-	-	-	-	-	1	200	568
Black caviar, in vessels up to 1 lb. 2 oz. ....	-	-	-	1/	6	17	-	-	-	-	-	-
Preserved sardines in airtight containers .....	1-	220	624	-	-	-	-	-	-	1	220	624
Edible fish eggs .....	1/	6	17	1/	3	9	-	-	-	1/	6	17
Preserved fish, n.s., and anchovies and herrings in airtight containers. . .	14	2,150	6,102	1/	4	11	-	-	-	14	2,150	6,102

1/ Less than 1,102 lbs.  
 2/ Prior to January 1960 preserved shrimp were included in the "preserved crustaceans" category.  
 3/ Not including re-exports.  
 Note: Values converted at rate of one Egyptian pound equals US\$2.838.

Table 4 - Egyptian Exports of Fishery Products to the United States, 1958-60, as Specified

Item	1959			1958			Jan.-June 1960			Jan.-June 1959		
	Quantity Metric Tons	Value		Quantity Metric Tons	Value		Quantity Metric Tons	Value		Quantity Metric Tons	Value	
		EL	US\$		EL	US\$		EL	US\$		EL	US\$
Crustaceans, fresh, salted, or cooked .....	20	5,393	15,305	1/	1	3	-	-	-	-	-	-
Black caviar, in containers up to 1 lb. 2 oz. ....	1/	304	863	-	-	-	-	-	-	1/	304	863
Preserved crustaceans, not in airtight containers <sup>2/</sup> .....	555	272,950	774,632	158	63,667	180,687	-	-	-	447	220,734	626,443
Preserved shrimp, not in airtight containers .....	-	-	-	-	-	-	294	111,821	317,348	-	-	-

1/ Less than 1,102 lbs.  
 2/ Until 1959 preserved shrimps were included under the "preserved crustaceans" category.  
 Note: Values converted at rate of one Egyptian pound equals US\$2.838.

## Egypt (Contd.):

first six months of 1960 were substantially less than in the first half of 1959 (table 3).

Exports of crustaceans (mostly frozen shrimp) to the United States increased from 158 tons valued at US\$180,690 in 1958 to 575 tons valued at US\$789,937 in 1959 (table 4)--U. S. Foreign Service Dispatch, Cairo, October 22, 1960.



## France

## FISHERY PRODUCTS IMPORTS SUBJECT TO QUANTITATIVE RESTRICTIONS:

The value of France's imports of fishery products subject to quantitative restrictions amounted to US\$9.2 million in 1958 as compared with US\$9.3 million in 1959. Fish oils and fats are the only products imported from the United States subject to quantitative restrictions. (United States Embassy, Paris, November 9, 1960.)

Shrimp are fished along the English channel, and the Atlantic and Mediterranean coasts. The principal fishing ports are Dunkerque, Boulogne, Honfleur, Caen in the Seine region; and the Atlantic ports of St. Nazaire, Le Crisic, La Truballe, Marenne, and Ile d'Oléron. Shrimp fishing takes place throughout the year but the catch is larger from May to October. Because of overfishing, the size of shrimp is small.

In view of small landings and large number of ports at which shrimp are landed, processing plants are not profitable. There are no shrimp-processing plants in France presently.

Type	1959	1958	1957	1956
	(Metric Tons)			
Shrimp ("crevettes grises")	1,042	1,035	1,200	1,324
Prawns ("crevettes roses" or "bouquet")	282	249	200	200
Total 2/	1,324	1,284	1,400	1,524

1/Major ports only, and does not include Mediterranean port landings.  
2/The grand total of France's shrimp landings (including an estimate of data not shown) would be approximately double the amount shown.

Table 1 - France's Imports of Fishery Products Subject to Quantitative Restrictions, 1958-59

Item	V A L U E			
	1959		1958	
	Millions Old Francs	US\$ 1,000	Millions Old Francs	US\$ 1,000
<u>Fresh fish (live or dead), chilled or frozen:</u>				
Trout . . . . .	96	195	86	205
Sea perch, sole, turbot, & brills . . . . .	1,152	2,350	1,045	2,488
Others . . . . .	1,122	2,290	1,222	2,909
Fillets . . . . .	680	1,387	676	1,610
Total . . . . .	3,050	6,222	3,029	7,212
<u>Fish salted in brine, dried or smoked:</u>				
Other fish in fillets . . . . .	45	92	81	193
Other fish, otherwise . . . . .	2	4	7	17
Total . . . . .	47	96	88	210
<u>Fats and oils of fish and marine animals, whether or not refined:</u>				
Fats and oils of other varieties of fish . . . . .	673	1,373	-	-
<u>Animal or vegetable oils and fats, hydrogenated, whether or not refined, not further prepared:</u>				
Fats and oils of sea animals . . . . .	21	43	-	-
Prepared or preserved fish including caviar and caviar substitutes . . . . .	768	1,566	733	1,745
Grand Total . . . . .	4,559	9,300	3,850	9,167

Note: No significant amounts of any of the above products are imported from the United States, except for "fats and oils of other varieties of fish"--16 million francs (US\$328,000) worth was imported from the United States in 1959.

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## SHRIMP INDUSTRY:

France's shrimp resources are limited and shrimp fishing is carried out on a small scale. Most fishermen do not fish for shrimp exclusively, but catch shrimp with their regular catch. Not more than half the catch of those boats specializing in shrimp fishing consists of shrimp.

French consumption and imports of shrimp and prawns is approximately 5,000-6,000 metric tons per year.

It is estimated that 400 small trawlers engaged in shrimp fishing though most fish for other species at the same time. These vessels are usually operated by their owners with the help of 2 or 3 assistants who are often members of the owner's family. The French fishing fleet was modernized





## German Federal Republic (Contd.):

## MARINE OIL PRODUCTION AND FOREIGN TRADE, 1958/59 and 1959/60:

Production: Marine oil production in Western Germany amounted to 21,700 metric tons in 1958/59 (July 1958-June 1959); this compares with 24,000 tons for 1959/60 (see table 1).

Table 1 - Western Germany's Production of Marine Oils, 1958/59-1959/60

Product	Amount Produced	
	1959/60	1958/59
	.....(Metric Tons).....	
<b>Marine Oils:</b>		
Inedible .....	9,000	8,300
Edible .....	15,000	13,400
<b>Total .....</b>	<b>24,000</b>	<b>21,700</b>

**Foreign Trade:** Imports of whale oil and fat into Western Germany decreased from 92,400 tons in 1958/59 to 80,600 tons in 1959/60. Fish-oil imports also decreased from 67,200 tons to 62,500 tons for the same period, including a small drop in menhaden oil imports from the United States from 21,000 tons in 1958/59 to 18,700 tons in 1959/60. The decline in imports of marine oils was due to smaller purchases by the margarine industry, which sought other oils.

Table 2 - Western Germany's 1/Foreign Trade in Marine Oils, 1958/60-1959/60

Product and Country	Imports		Exports	
	1959/60	1958/59	1959/60	1958/59
	.....(Metric Tons).....			
<b>Whale Oil:</b>				
Norway .....	17,500	32,900	-	-
Japan .....	34,300	41,500	-	-
Other .....	28,800	18,000	-	-
<b>Total .....</b>	<b>80,600</b>	<b>92,400</b>	<b>-</b>	<b>-</b>
<b>Fish Oil:</b>				
United States .....	19,700	21,000	-	-
Peru .....	13,000	3,900	-	-
Norway .....	6,700	6,700	18,300	3,500
Others .....	23,100	35,500	12,700	13,000
<b>Total .....</b>	<b>62,500</b>	<b>67,200</b>	<b>29,000</b>	<b>16,500</b>
1/Including West Berlin; Saarland included since July 1959.				

Imports of menhaden oil from the United States dropped to 7,600 tons in January-June 1960 as compared with 9,900 tons in the same period of 1959 and 11,900 tons during the second six months of 1959. But Peru was able to step-up its exports to West Germany (3,000 tons during the first half of 1959, 5,000 tons during the second half of 1959, and 8,000 tons during the first half of 1960).

**Exports** (mainly to Norway) of fish oils increased from 16,500 tons in 1958/59 to 29,000 tons in 1959/60 (see table 2). (U. S. Foreign Agricultural Service Report, Bonn, October 4, 1960.)



## Greece

## SHRIMP INDUSTRY:

The freezing and processing of shrimp in Greece is practically nonexistent. This is due to the fact that there is a definite preference for fresh shrimp in the Greek market and the annual landings (about 400 metric tons) are too small to support a processing industry. Of the four fish-canning plants in operation (output about 1,200 metric tons in 1959), only one has been partly engaged in the processing of shrimp. Processing is confined to peeling and canning only. The production of canned shrimp amounts to about two metric tons annually. Shrimp is canned in 5½-oz. cans, natural style, and is wholesaled at 15 drachmas (about 50 U. S. cents) a can and retailed at 17.30 drachmas (about 58 U. S. cents) a can.

The entire production of canned shrimp is consumed locally. Local consumer requirements for canned shrimp are met chiefly through imports (13 tons in 1959) which originate principally from the United States (11 tons in 1959). To supplement the light landings of fresh shrimp, small quantities of frozen shrimp are imported. There are no controls, subsidies, or taxes in Greece on processed or fresh shrimp exports.

Principal shrimp fishing grounds are located in the waters of the Gulfs of Thermaikos and Amvrakikos, around Volos, and at the Delta of the Evros River. The seasons for shrimp fishing are from September-December and from March-May. The major species caught are: Penaeus kerathurus caramote (16-27 heads-on shrimp per pound), which account for about 50 percent of the total annual landings; Parapenaeus longirostri (36-54 heads-on shrimp per pound), about 35 percent of annual landings; and Palaemon elegance (363-544 heads-on shrimp per pound), about 15 percent of the annual catch.

Of the species mentioned, Parapenaeus longirostri is principally caught in deep-sea waters, together with other fish, by trawlers which operate not only in the shrimp fishing grounds mentioned but in other areas as well. Parapenaeus kerathurus caramote and Palaemon elegance are fished in shallow waters, the latter being used more as a bait than as a food item.

Greek fishery statistics are unreliable and, according to the Director of Fisheries of the Greek Ministry of Industry, underes-

## Greece (Contd.):

timate actual landings considerably as they are based on statements filed by fishermen who either understate their actual catch or do not file a report at all. Furthermore, fishery statistics are broken down by the most important species of fish, each one of which comprises fish of various type. Only rough estimates on the annual landings of shrimp are available from the Directorate of Fisheries. According to this source, the annual catch of shrimp, as compiled on the basis of the statements filed by fishermen, averaged 220-240 tons (heads-on) for the period 1956 through 1959. Fishermen's statements covering the first half of 1960 show increased landings amounting to about 180 tons of heads-on shrimp. The same source estimated actual landings in the vicinity of 400 metric tons of heads-on shrimp annually for the period 1956-1959 and 280-300 metric tons for the first half of 1960.

Greek fish landings usually consist of a great variety of species with relatively small catches of individual species. For this reason, there is no shrimp fishing fleet as such. The entire Greek fishing fleet brings in shrimp together with various other fish. However, more systematic shrimp fishing operations are carried out by those vessels which are stationed in the ports of Thessaloniki, Volos, Alexandroupolis, and Preveza, which are located near the principal shrimp fishing grounds.

Small motor boats, rowboats, and sailboats engage more systematically in the fishing of shrimp than motor trawlers, which conduct general fishing. The tonnage of the motor trawlers ranges from 30-70 tons (50-300 hp.) and the small motorboats are from  $\frac{1}{2}$  to 3 tons (average 8 hp.).

Wage rates paid to unskilled female workers engaged in the manual peeling of shrimp have been fixed at 42 drachmas (US\$1.40) daily. Skilled workers who engage in the canning of shrimp get an average monthly salary of 2,000 drachmas (\$66.66). Fish canning experts are remunerated at the rate of 4,000 drachmas monthly (\$133.33). Wage earners get bonuses for Christmas and Easter amounting to 25 and 15 daily wages, respectively. Salaried employees also receive a full month's pay as a bonus for Christmas and half a month's pay for Easter. Basic wages and salaries mentioned above, as well

as Christmas and Easter bonuses, are subject to a 25-percent charge for the employees' and workers' Social Insurance benefits. This charge is contributed both by the employer (17 percent) and the employee or worker (8 percent).

Fishermen's wages are based on fixed pay as well as on a share basis. In the case of rowboats and sailboats, the owner gets 75 percent of the catch whereas the balance is given to his assistant, the latter usually being a member of the owner's family. In the case of small motorboats, remuneration is also effected on a share basis with the owner usually retaining 50-65 percent of the catch, the balance being distributed among the members of the crew. Wages on motor trawlers are determined on the basis of collective bargaining agreements which provide for fixed pay ensuring an average level of earnings of about 1,300 drachmas (\$43.33) monthly for deckhands. The captain of the trawler receives about 4,000 drachmas (\$133.33) monthly. In cases where motor trawlers operate in areas where fishing grounds are poor, remuneration is fixed on a share basis with the owner of the vessel retaining 50 percent of the catch and the balance being distributed among the captain, engineer, and crew, with the first two getting higher shares.

Where the fishermen's wages are on a fixed basis, the shipowner usually contributes the entire amount of the social insurance fee (16 percent) which goes to the Seamen's Pension Fund. Where wages are on a share basis and where fishing is carried by small craft or in areas where fishing is not an organized profession, social insurance benefits do not exist.

Prospects for expanding the Greek shrimp-processing industry are not very encouraging. Almost the total shrimp catch is consumed fresh and surpluses available for processing are too small to support even moderate scale operations. Increased landings of shrimp are improbable due to the low yield of known shrimp fishing grounds.

The Directorate of Fisheries of the Greek Ministry of Industry plans to engage in fishery research with a view to locating new fishing grounds for shrimp in deep waters. The Greek Government has also started implementation of a program providing for the establishment of fish-receiving stations at

## Greece (Cont.):

the ports of Piraeus, Thessaloniki, Patras, Cavalla, Volos, and Chalkis. (U. S. Embassy, Athens, November 25, 1960.)



## Guatemala

SHRIMP INDUSTRY, 1959-60:

As of November 1960, fishing grounds on both coasts of Guatemala were little known and poorly developed.

On the Pacific coast a shrimp fishery has been developed in Mexican and Salvadoran waters. It is presumed the shrimp stocks are continuous along both coasts of Guatemala. From the success experienced by the few boats fishing in Guatemalan waters, this supposition is apparently correct. In shallow water, white shrimp are the most common, whereas in deep water, brown shrimp are more common. The catch is increasing, however, as the fishermen become better acquainted with the shrimp grounds. There are five commercially-important species of shrimp in Guatemalan waters; since seasons of abundance vary, there can be a continuous supply.

In the Caribbean, the shrimp are mostly white and the catch is mostly seasonal. Few shrimp are caught from March-June, and in July small shrimp are present. From August to April large shrimp abound in that area.

Only one processing plant operates in Guatemala with a capacity of five tons daily. This plant, located in Champerico on the west coast near the Mexican border, freezes the shrimp taken on both coasts. All processing is done by hand labor except for the use of a fork lift that lifts shrimp from the wharf to the plant. The Guatemalan shrimp caught off San Jose go to Salina Cruz, Mexico, for processing and are then exported to the United States.

Guatemala's estimated landings of shrimp (heads-off weight) for 1958-60 were reported as follows: July-December 1959, 87,120 pounds (Pacific 28,125 pounds and Atlantic 58,995 pounds); January-August 1960, 335,961 pounds (Pacific 264,602 pounds and Atlantic 71,359 pounds); and September 1960, 84,061 pounds (Pacific). Another source estimated shrimp landings in 1959 as 281,000 pounds.

January-August 1960 landings by species were as follows: Pacific Coast; white shrimp, 59,321 pounds; red shrimp, 28,377 pounds; and unclassified shrimp, 176,904 pounds. Atlantic Coast: white shrimp, 33,546 pounds; and unclassified 37,813 pounds.

As of November 1959, 10 shrimp vessels were fishing out of Guatemalan ports--7 of Mexican registry and 3 of Guatemalan registry. Six additional vessels were reported as being out of commission (sunk, returned to the United States, or tied-up). Reports from Japan indicate plans to have two fishing vessels on the Pacific coast of Guatemala by December 1960.

As of November 1959, all previous exports of Guatemalan shrimp had been to the United States. January-October 1960 shrimp exports were estimated at 306,836 pounds (heads-off), but largely went to Mexico for processing and then to the United States. The U. S. Bureau of the Census reports that in 1959 shrimp exports from Guatemala to the United States amounted to 182,232 pounds valued at US\$133,372.

The major deterrent to the expansion of the Guatemalan shrimp fishery in the Pacific is lack of a suitable port. Otherwise, Guatemala could probably produce 4 million pounds annually. (U. S. Embassy, Guatemala, November 23, 1960.)

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## India

SHRIMP INDUSTRY:

The shrimp fisheries currently being exploited by Indian fishermen are primarily close to the coast and in the estuaries, backwaters, and salt-water lakes along the western coast of India, especially around Karala and Bombay, and to a much lesser extent off the east coast. The shrimp fishing grounds on the west coast extend to 50 miles from the coast in the north (off the Gulf of Kutch), to about 25 miles from the coast at Bombay, and to about 15 miles off the coast in the south at Cochin. East coast shrimp fisheries are being surveyed and potential catches appear to be great, especially off Tuticorin, Cuddalore, Pulicat, the mouths of the Godavari and Mahanadi Rivers, and at the head of the Bay of Bengal, according to the Assistant Fisheries Development Adviser of the Government of India.

There are 11 fish processing plants in India. All but the plant at Calicut process shrimp, and all are freezing plants. One plant at Cochin and the one at Mangalore also can shrimp. No information is available on the extent of mechanization in the processing plants:

The estimated landings of heads-on shrimp in India are as follows: 1959, 65,437 metric tons; 1958, 85,191 tons; 1957, 137,000 tons; and 1956, 160,000 tons. No breakdown of the landings by major types or species is available, except that the 1959 catch consisted of 27,632 metric tons of penaeid shrimp and 37,805 metric tons of non-penaeid shrimp or prawns (heads-on). Fisheries products landings statistics are rough estimates in India, and no estimate of landings for 1960 is available.

It is not clear why landings of shrimp have fallen so sharply in the last three years. It is believed that reclamation of backwater areas for paddy cultivation may cut into the output of the small shrimp caught in such areas. Such a trend was not likely to continue because of the conservation measures being taken, but on the other hand, the future increase in the shrimp catch would be primarily the result of extending exploited fisheries outward from the shore rather than of more intensive exploitation of backwaters and close-in fisheries.

It is impossible to separate figures for shrimp vessels from those for fishing vessels as a whole, partly because the same boats are used for shrimp fishing as are used for other types of fishing. It has been estimated that in 1959 there were about 86,700 fishing vessels in India, including about 1,700 mechanized craft. The State Governments of Gujarat, Maharashtra, Andhra Pradesh, and Kerala have small programs to assist in the construction of non-mechanized vessels. Vessel programs of the Central Government are concentrated on construction of powered vessels; about 650 boats were mechanized by 1956, and about 850 more vessels have been mechanized since that time. It is planned to mechanize another 4,000 boats during the Third Five-Year Plan (by 1966), but that figure has not yet been finally agreed to by the Government planning organizations. All vessels are primarily Indian-owned, but there are two fishing companies exploiting shrimp fisheries for export which involve foreign minority participation. One of these is 49 percent owned by Japanese interests, and the other recently-formed company has 49 percent United States participation.

The establishment of the company with United States capital is dependent on approval by the Ministry of Commerce and Industry which is expected momentarily. The joint Japanese-Indian company has four bull trawlers, while the company with United States capital is to have six vessels in Visakhapatnam and six in Tuticorin.

Exports to the United States are primarily frozen shrimp, while shrimp sold to Burma (the other most important customer for Indian shrimp) are mostly dried.

The Indian Government imposes a tax of Rs. 0.75 (\$0.16) a hundredweight (112 pounds) on exported shrimp, theoretically

## India (Contd.):

Country of Destination	Jan. - Aug. 1960		1959	
	Quantity	Value	Quantity	Value
	1,000 Lbs.	US\$	1,000 Lbs.	US\$
Burma . . . . .	4,020	989,500	3,688	902,276
Ceylon . . . . .	378	79,234	3,976	782,741
Hong Kong . . . .	243	65,420	923	237,820
Mauritius . . . . .	44	17,054	167	59,195
Singapore . . . . .	218	63,950	426	121,705
United States . . .	1,610	685,674	2,235	981,805
Others . . . . .	150	59,228	184	83,418

i/Includes data for 27 areas.  
Note: Values converted at rate of one rupee equals US\$0.21.

to finance research projects connected with the shrimp fisheries. At present the Government is considering a proposal to eliminate the tax. Shrimp exports are not subsidized, but the Government assists in the establishment of facilities for catching and preparing shrimp for export in several ways, such as through facilitating issuance of licenses for imports of packaging materials and extending loans to new companies. Further measures, including a subsidy on tinplate and remission of the duty on imported packaging materials, are under consideration.

Little useful information is available on wage rates for processing plants. However, it has been reported that wage rates in Madras State for peeling, deveining, and brining average between Rs. 1.5 and Rs. 3 (\$0.31-\$0.63) a day, paid daily in cash. No comparable data are available for wage rates in freezing plants.

Fishermen typically either sell their catch to middlemen daily or, apparently in fewer cases, make arrangements before the season begins for delivering their entire season's catch to a middleman at a predetermined price. In Madras State, the average daily income of a fisherman varies widely (depending on the catch), or about Rs. 1.5 and Rs. 10 (\$0.31-\$2.10). The Indian Government expects to conduct a comprehensive survey of the income of fishermen which, however, will not be completed before 1963.

It appears that India is at present catching only a small fraction of the potential output of its shrimp fisheries. Deeper waters than are now generally exploited and the fisheries off the east coast, which are practically untouched, offer the primary opportunities for expansion. It is likely that significant expansion of shrimp output, particularly for export purposes, will require extensive participation by foreign companies, both because of the apparent reluctance of Indians to conduct larger scale offshore operations and because of the requirement of imported machinery for vessels and processing plants. Despite uncertainty of the reasons for the decline in production of shrimp during the past few years, it seems probable that the trend will be reversed because of the Government's increasing interest in exploitation of fisheries



Young women in a plant in India packing raw headless shrimp for freezing.

to improve the Indian diet and ease India's serious foreign exchange situation through exports, and because of the generally developing interest of foreign, particularly Japanese and American, investors in exploiting Indian shrimp fisheries for export.

It is not expected that there will be any great change in the types and species of shrimp currently exported to the United States or elsewhere. (U. S. Embassy, New Delhi, December 2, 1960.)



## Japan

### FISHERIES AGENCY RESEARCH VESSEL TO EXPLORE ATLANTIC TUNA AREAS:

The Japanese Fisheries Agency in November 1960 decided to send its research vessel *Shoyo Maru* (604 tons) to explore the tuna areas in the Atlantic. The objectives of the trip are: Explore tuna fishing areas in the West Atlantic and those off the southwestern coast of Africa; conduct studies on "green meat" tuna; survey fisheries and fishing bases in the area.

The vessel left Tokyo in the fall of 1960 and was expected to return early in 1961, after visiting Colombo (Ceylon), Cape Town, Freetown, Dakar, Las Palmas (Canary Islands), Venice, Port Said, Suez, and Singapore.

Plans of operation include long-line fishing with 800 hooks once a day, set before dawn and hauling to begin at 10 a.m. Off the southeast coast of Africa, 14 operations and in the western Atlantic, 12 operations are planned. Observations are to include analysis of conditions at the time of setting and hauling the line.

At noon every day, meteorological observations are scheduled, including sea and air temperatures; collecting sea water, plankton; measuring depth, transparency, weather, wind, and air pressure.

Measurement of important species is planned: yellowfin, big-eyed, bluefin, and albacore tuna, including observations on feed, blood, and internal organs.

Studies on "green meat" tuna are planned to determine the cause of the condition.

Disposition of catch, operational conditions of foreign fishing vessels, and market conditions at ports of call are to be observed and surveyed. (Fisheries Economic News, November 10, 1960.)

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Japan (Contd.):

### PACK OF NEW CANNED TUNA PRODUCT TO BE INCREASED:

Sales in 1960 of the new Japanese canned tuna product ("Tender Tuna") which was put on the market late in June 1960, will be close to 200,000 cases, according to the Japanese canning firm. The company intends to increase the pack to 400,000 cases in 1961. The packing in 1961 will be done at several plants besides the original cannery of Yaizu. Domestic sales have been 70 percent in No. 3 cans and 30 percent in No. 2 cans (can number designations in Japan are different than in the United States). Each of the four differently-flavored sauce packs have sold in about equal amounts. (Japanese newspaper, November 21, 1960.)

Note: Also see Commercial Fisheries Review, October 1960 p. 65.

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### EXPORTS OF CANNED SARDINES IN TOMATO SAUCE, 1959:

In 1959, the Japanese exported 618,330 cases of canned sardines in tomato sauce. Of this amount, 405,882 cases were exported to the Philippines; 104,030 cases to Africa; 61,428 cases to Belgium; 10,952 cases to Singapore; 7,374 cases to the Netherlands; and 28,664 cases to other countries.

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### PACK OF PET FOOD MADE FROM FISH DECLINES:

The Japanese 1959 pack of canned pet foods made from fish for export to the United States amounted to about 770,000 cases, of which 650,000 cases were exported. In 1960, only about one-half of that quantity was packed due to unusually poor skipjack tuna and mackerel-pike fishing. Since pet-food packing is a byproduct operation, the scarcity of fish has adversely affected this industry. Also, quality claim problems arose in 1960 which have caused the Japanese packers to lose interest. (The Suisan Tsushin, October 29, 1960.)



## Korea

### SHRIMP INDUSTRY:

There are no specialized shrimp fishing vessels in Korea; the locally-owned vessels engaged in other fisheries also catch shrimp. Some of the vessels are in operation

Table 1 - Korea's Shrimp Landings, 1958-59 and January-August 1960

Year	Large	Medium	Small	Total
	..... (1,000 Lbs.) .....			
Jan.-Aug. 1960 . . .	789	1,184	12,685	14,658
1959 . . . . .	1,839	4,237	37,139	43,215
1958 . . . . .	1,404	1,285	35,926	38,615
Plan for 1960 . . .	1,984	661	39,242	41,887

throughout the year. Current discussions in the Korean Office of Marine Affairs call for additions to the fishing fleet in 1961, largely as replacements for obsolete vessels. If such vessels are built, there will be some net gain in the shrimp catch potential because the Government would likely modify its regulation to allow the use of more effective gear for shrimp fishing. However, a limiting factor in the volume of the catch is the shrimp area itself which is unlikely to produce a volume at all comparable with the recognized large shrimp fishing grounds in the Western Hemisphere.



Through August 1960, the total shrimp catch was only 6,648 metric tons, at an annual rate of slightly over half of the 19,000 tons planned for the year. The drop in landings was mainly in small shrimp, which accounts for about 80 percent of the total landings. These very small shrimp are usually dried, pickled, or made into a paste for the domestic market, or for export, in the case of the dried shrimp.

Table 2 - Korea's Exports of Shrimp by Type and Destination, Quantity, and Value, 1956-59 and Jan.-Aug. 1960

Year	Frozen Shrimp <sup>1/</sup>		Dried Shrimp	
	1,000 Lbs.	US\$ 1,000	1,000 Lbs.	US\$ 1,000
Jan.-Aug. 1960 . .	70	32.4	54	2/26.4
1959 . . . . .	97	38	97	3/28
1958 . . . . .	130	73	20	4/12
1957 . . . . .	44	20	701	90
1956 . . . . .	-	-	28	17

<sup>1/</sup>All exported to United States.

<sup>2/</sup>Includes shipments to the United States valued at US\$15,500.

<sup>3/</sup>Includes shipments to the United States valued at US\$13,000.

<sup>4/</sup>Includes shipments to the United States valued at US\$11,000.

The relatively small catch in 1960 can be attributed to the depressed price for shrimp in the international market in 1959 as well as to damage to the fishing fleet in September 1959 by Typhoon Sarah. The catch in 1959 was larger than that of the preceding year, but the production did not come up to expectations for the year. The gain in the catch of medium-size shrimp in 1959 compared with 1958 is noteworthy.

Processors of frozen shrimp (as well as other fishery products) are under the supervision of the Office of Marine Affairs of the Ministry of Commerce and Industry, which is responsible for minimum sanitary standards. All processors and packers for export are required to be members of one of the Korean food export associations which has to approve the quality of the products before they can be exported.

## Korea (Contd.):

As is the case in most businesses in Korea, the shrimp industry has had financial difficulties. The Ministry of Commerce and Industry considered introducing an export subsidy to aid the industry, but such a subsidy has not been provided. The 1960 price firmed up somewhat compared with that of 1959, especially for the frozen products. However, by June 1960 the export of frozen shrimp ceased, for a time at any rate, due to difficulties in the local operation, including poor trade representations and insufficient revolving capital to cover the time lag involved for shipment, payment, and other financial details. The Korean Frozen Foods Association is exploring the possibility of sales to Japan which has a market advantage, due to the distance, for transportation costs and, the Association hopes, for cutting the time lag on movement of funds.

The United States is Korea's best market for frozen shrimp which accounted for \$73,000 in foreign exchange in 1958, the record year. In addition to the exports, about 10 tons of frozen shrimp are sold annually to United Nations Forces in Korea. The principal markets for the dried shrimp are the United States and Hong Kong.



## Morocco

## SHRIMP INDUSTRY:

The two principal outlets for the Moroccan shrimp fishing industry are the local market for fresh shrimp, and the market in France for frozen shrimp. The main fishing grounds are located in the waters off Casablanca and Tangier. Shrimp are generally available all year, although more abundant during January and February. The processing industry is centered in Casablanca where 14 out of Morocco's 19 plants are located. In Casablanca, some 2,000 women are employed in shrimp-freezing plants. Peeling, deheading, and deveining are hand operations. Machines are too expensive. Processing consists of peeling, deheading, deveining, cooking, and freezing. The shrimp are packed in one- or two-kilo (2.2- or 4.4-pound) cartons. The shrimp used for canning are very small and canned in  $\frac{1}{4}$ " Dingley" cans. Estimated landings during the first six months of 1960 were about 660 tons. In 1959, shrimp landings (970 tons) at Casablanca accounted for about 77.6 percent of the total for the year.

Pink shrimp (crevettes roses) or *Parapenaeus languostris*, predominate in Moroccan waters. All sizes are caught and graded large, medium, and small. Other species are not classified according to size and are called prawns (crevettes bouquets) and are smaller than the pink shrimp. The pink shrimp run 130 shrimp to the kilo (about 60 shrimp per pound).

The present Moroccan shrimp fleet is composed of 80 trawlers. In Tangier, the boats generally have a 70-metric-ton displacement, are 20 meters long (about 66 feet), have 170-hp. engines, and carry a crew of ten. The Casablanca trawlers have also a displacement of 70 tons but are 19 meters (about 62 feet) long with a 180-hp. engine and a 12-man crew. No substantial increase in this fleet is anticipated. The majority of the vessels are owned by Spanish, Portuguese, or French. Only five or six boats are owned by Moroccan nationals.

Exported frozen shrimp are peeled and deveined. Almost all shrimp are exported to France, a duty-free status is accorded them during the first 3 or 4 months of each year and only a nominal landing tax of 10 percent is charged.

Year	Destination	Quantity	Value	
			Pounds	US\$
1960/1	France . . . . .	119,802	48.1	95.0
	All Others . . . . .	1,387	0.6	1.2
	Total . . . . .	121,189	48.7	96.2
1959	France . . . . .	88,669	25.9	58.2
	All Others . . . . .	6,585	2.7	6.2
	Total . . . . .	95,254	28.6	64.4
1958	France . . . . .	309,878	106.0	261.6
	All Others . . . . .	30,435	11.7	28.9
	Total . . . . .	340,313	117.7	290.5
1957	France . . . . .	100,435	24.8	81.3
	All Others . . . . .	7,271	1.9	6.4
	Total . . . . .	107,706	26.7	87.7
1956	France . . . . .	106,222	29.1	83.3
	All Others . . . . .	13,847	3.8	10.8
	Total . . . . .	120,069	32.9	94.1

1/January-September only.  
 Note: (1) Currency values converted as follows:  
 1956 - 350 Moroccan francs equal US\$1;  
 1956 - 305;  
 1958 - 405;  
 1959 - 444;  
 1960 - 506;  
 (2) None exported to the United States.

Export controls consist mainly of quality control exercised by a government agency. That office also acts as a trade promotion agency and has offices in principal European cities as well as New York City. An export tax of 0.5 percent is charged to help support the agency. In addition, an export tax of 1 percent is charged by the customs authorities on all items exported. A landing tax of 5 percent is levied on all shrimp unloaded in Moroccan ports. No subsidies were being given to the fish industry as of December 1960.

## Morocco (Contd.):

Year	Destination	Quantity		Value	
		1,000 Lbs.	1 Million Moroccan Francs	US\$	1,000
1960/1	France . . . . .	1,143	361.8	714.9	
	All Others . . . . .	1	0.5	1.0	
	Total . . . . .	1,144	362.3	715.9	
1959	France . . . . .	1,112	296.6	667.8	
	All Others . . . . .	6	1.8	4.1	
	Total . . . . .	1,118	298.4	671.9	
1958	France . . . . .	917	279.2	689.3	
	All Others . . . . .	6	1.6	3.9	
	Total . . . . .	923	280.8	693.2	
1957	France . . . . .	325	77.5	253.9	
	All Others . . . . .	7	0.7	2.4	
	Total . . . . .	332	78.2	256.3	
1956	France . . . . .	166	31.8	90.9	
	All Others . . . . .	72	4.5	12.9	
	Total . . . . .	238	36.3	103.8	
1/January-September only.					
Note: None exported to the United States.					

The minimum wage in the fish-processing industry is established at 81 Moroccan francs an hour, the equivalent of 16 U. S. cents. A 48-hour maximum work week is in force.

Fishermen are paid on the following basis: One half of the value of the catch is given to

Fishing Occupation	Salary, US\$
<b>1. For vessels out more than 24 hours:2/</b>	
Master fisherman . . . . .	1,809
Skipper and first mate . . . . .	905
Engineer . . . . .	1,206
Second engineer . . . . .	753
Seaman . . . . .	653
Cabin boy or beginner . . . . .	356
<b>2. For vessels out less than 24 hours:</b>	
Master fisherman . . . . .	1,042
Skipper and first mate . . . . .	522
Engineer . . . . .	692
Second engineer . . . . .	435
Seaman . . . . .	375
Cabin boy or beginner . . . . .	342
1/November, 1960.	
2/The boats in Casablanca and Tangier generally are in the second category. Those with Agadir for home port generally stay out two or three days.	

the owner of the boat. The other half is divided between the master and the crew, after operating expenses have been deducted.

The catch of shrimp has about kept up with demand. The catch has increased steadily but not greatly over the previous four years. However, if world demand increases, production is capable of being expanded. Morocco is searching for products to export to balance its trade.

As of December 1, 1960, the United States had not figured in the trade in shrimp. The most likely type that could be exported to the United States would be small canned shrimp. (American Consulate General, Casablanca, December 1, 1960.)



## Nicaragua

## SHRIMP INDUSTRY:

Virtually all Nicaraguan shrimp fishing is now done by a French firm located in Puerto de El Bluff on Bluefields Island.

The Nicaraguan shrimp fishing grounds are located off the entire length of the country's east coast, although the industry is too new as yet to determine the exact location of the best shrimp beds. Shrimp are available throughout the year, but the best fishing season is between mid-June and mid-March. White shrimp are caught in the daytime and "red" shrimp at night. The port of El Bluff is the center of the industry. The only processing plant has the following facilities:

A 550 kw. powerhouse for supplying all of the firm's installations.

A daily capacity for 66,000 pounds of ice in blocks and 14,000 pounds in flakes. Two ice-storage rooms with a capacity for 400,000 pounds.

Two freezing tunnels, each with a capacity of 20,000 pounds every 20 hours, and there is cooler space for 300,000 pounds of processed shrimp.

Two low-temperature storage rooms, with a capacity of 300,000 pounds.

Two prerrefrigeration rooms for storing the products when unloaded until they are graded and packed.

One work room (198 x 49.5 feet) equipped with a double shrimp grader. There is another work room (49.5 x 72.5 feet) equipped with a boiler and a rustproof cooking vat used for processing products exported to Europe.

A work room (198 x 49.5 feet) is used for the cannery. A high-pressure boiler has already been installed and the other equipment is being set up.

A warehouse, connected to the wharf by the railroad, supplies all fishing items (nets, cables, anchors, chains, ropes, etc.) and parts for motors and radios as well as sheet iron, etc. Value of stock ranges from US\$100,000-150,000.

Month	Heads-off Shrimp to the Pound							
	Under 15	16/20	21/25	26/30	31/35	36/40	41/50	
. . . . . (U. S. Cents a Pound) . . . . .								
January . . . . .	84	79	69	60	54	53	51	
February . . . . .	84	81	69	60	54	53	51	
March . . . . .	85	85	74	65	62	57	54	
April . . . . .	87	85	76	73	68	66	61	
May . . . . .	90	90	82	75	69	65	62	
June . . . . .	92	90	84	76	72	67	60	
July . . . . .	90	87	80	76	71	62	59	
August . . . . .	-	88	83	73	64	60	60	
September . . . . .	-	88	82	73	64	60	60	



## Nicaragua (Contd.):

Table 2 - Nicaragua's Shrimp <sup>1/</sup> Exports (headless) by Country of Destination, 1956-58 and January-June 1960			
Year	Country of Destination	Quantity	Value
		Lbs.	US\$
Jan.-June 1960 . .	Costa Rica	528	200
	El Salvador	7,123	3,800
	United States	236,126	91,464
	Total . . .	243,777	95,464
1959 . . . . .	Costa Rica . .	7,746	3,300
	El Salvador . .	1,223	720
	Panama . . . .	15,003	5,330
	United States	420,983	183,220
Total . . .	444,955	192,570	
1958 . . . . .	Panama . . . .	6,008	3,600
	United States	602,811	315,721
	Total . . .	608,819	319,321
1957 . . . . .	Costa Rica . .	1,213	575
	Panama . . . .	1,569	750
	Total . . .	2,782	1,325
1956 . . . . .	<sup>2/</sup>	<sup>2/</sup>	<sup>2/</sup>

<sup>1/</sup> Includes white, brown, and pink shrimp.  
<sup>2/</sup> No exports.

For the years 1956 to 1959, the El Bluff plant gives no statistics on landings of shrimp as their plant was being constructed, but estimates landings for 1960 at 490,000 pounds, heads-off. No breakdown of landings by sizes is available, but the plant's estimated percentages based on studies made in 1958 and on actual fishing since August 1959 are as follows: under 15 count, 2 percent; 16-20 count, 18 percent; 21-25 count, 42 percent; 26-30 count, 31 percent; 31-35 count, 4 percent; and 36-40 count, 3 percent.

There are 22 vessels with Diesel motors of 140-200 hp. The length of the vessels ranges from 62-72 feet. The El Bluff firm plans to obtain about 25 vessels from the United States in a short time. Of the 22 vessels mentioned, 11 are Nicaraguan-owned, one is Costa Rican-owned, and 10 are owned by United States citizens.

Exports to the United States by the firm operating at the port of El Bluff during July-September 1960 averaged 52,625 pounds.

There are no current export controls, subsidies, or taxes on shrimp in Nicaragua. The El Bluff firm has a 20-year license allowing them to fish on the Atlantic Coast of Nicaragua.

The wage rate for packing is 4 U. S. cents a pound, 19 cents a pound for peeling and deveining the large shrimp, and 29 cents a pound for peeling and deveining the small shrimp.

With arrival of 25 vessels from the United States, it is expected that the annual catch will increase substantially. Also, with the use of depth sounders on each boat, it will be possible to catch larger quantities of the brown and pink varieties of shrimp. (United States Embassy in Nicaragua, December 1, 1960.)

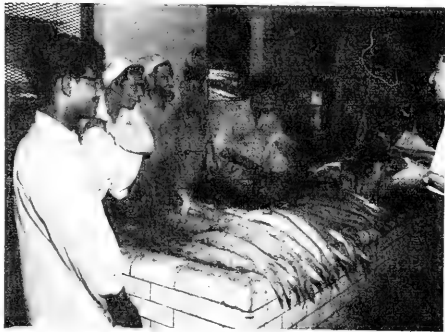


## Pakistan

## FISHERY TRENDS, NOVEMBER 1960:

Like those of India, waters off the coast of Pakistan are rich in fish and shellfish. Through aid from the U. S. International Co-operation Administration, modern facilities for handling fish have been installed at Karachi harbor. These include docks, market place, refrigeration facilities, and an assembly room. Mackerel, pomfret, sole, shark, and shrimp occur in abundance. During the peak season 30,000 pounds of shrimp are processed daily, and 10,000 pounds are processed daily during the off-season. Some of the shrimp are exported to the United States. Large quantities of salted shark are exported to Ceylon and Singapore.

Aside from Karachi, the fishing industry is not well developed along the coast of West Pakistan. People in the northern portion of West Pakistan eat little fish due to the distance from the coast and lack of refrigeration facilities during transportation.



Stall in Karachi's central fish market where fresh fish from the Arabian Sea is offered for sale.

The Biochemical Research Department of Pakistan's Central Laboratory at Karachi is working extensively on the extraction, analysis, and processing of shark-liver oil for vitamin A. The oil averages about 15,000 units per gram of vitamin A--nearly 25 times as much as standard cod-liver oil. Of the six species of shark obtained at Karachi, the hammerhead (*Sphyrna blochii*) is the richest source. Research is also in progress on the processing of fish flour from shark meat for human food. (American Embassy, New Delhi, November 23, 1960.)

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Pakistan (Contd.):

### FIRST SHRIMP EXPORTS TO UNITED STATES FROM EAST PAKISTAN:

On July 28, 1960, frozen shrimp exports from East Pakistan to the United States were initiated with a sample consignment of five tons. The Director of Fisheries for East Pakistan predicted that 120 tons would be exported by the end of 1960, the United States Consul at-Dacca reported on November 18, 1960.



## Peru

### EXPORTS OF MARINE PRODUCTS, JANUARY-SEPTEMBER 1960:

Exports of principal marine products by Peru during the first nine months of 1960 amounted to 453,133 metric tons (valued at about US\$41 million). Fish meal exports

Peruvian Exports of Principal Marine Products, January-September 1960							
Marine Products	July-Sept. 1960			Jan.-Sept. 1960			Value US\$
	Qty. Metric Tons	Value Million Soles	Value 1,000 US\$	Qty. Metric Tons	Value Million Soles	Value 1,000 US\$	
Fish meal	98,097	189.4	6,850	383,600	850.2	30,749	
Fish (frozen, canned, etc.)	8,087	49.0	1,772	24,862	155.6	5,627	
Fish oil	10,553	29.7	1,074	23,728	67.9	2,456	
Sperm oil	4,208	14.9	539	9,489	32.4	1,172	
Fertilizer (guano)	8,827	22.0	796	9,941	24.5	886	
Whale meal	1,205	2.1	76	1,513	2.6	94	
Total	130,977	307.1	11,107	453,133	1,133.2	40,984	

(383,600 tons valued at US\$30.7 million) were up 108.8 percent in quantity and 47.4 percent in value as compared with the 183,685 tons valued at US\$20.9 million exported during a similar period of 1959. Average prices for fish meal (January-September 1960) at about US\$80.16 a metric ton were down sharply from the average of about US\$113.54 a ton received during the same period of 1959.

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### FISH MEAL INDUSTRY, 1955-60:

This report is based on information supplied by the President of the Belgian Association of Fish Meal Manufacturers and the Belgian Embassy at Lima, Peru. The report was submitted to the Belgian Government by the Belgian Association along with a request that measures be taken to protect the Belgian fish-meal industry.

Over the past few years the Peruvian fish-meal industry experienced a spectacular growth. Production amounted to 14,637 metric tons in 1954, and increased as follows: 19,217 tons in 1955; 28,922 tons in 1956; 62,945 tons in 1957; 107,471 tons in 1958; and 274,800 tons in 1959.

It was anticipated that 1960 production would be 500,000 to 600,000 tons. Landings decreased from May to September, therefore it was possible that production fluctuated around 500,000 tons; 400,000 tons had been sold by May 1960. In 1960, Peru reduced prices substantially as compared with 1958. Since Peru has no storage facilities and the credit rate of banks fluctuates between 15 and 20 percent per year, the Peruvian producers sold fish meal at whatever price they could obtain, even if lower than cost.

During a meeting, reported by the newspaper *La Prensa*, (June 24, 1960), Peruvians admitted that the price had decreased below cost. It was suggested that Peru stop granting licenses for the construction of new plants and limit exports. No agreement, however, was reached. *La Prensa* added that the f.o.b. price had decreased from US\$140 a metric ton to below US\$60.

Another report indicated that Peruvian production costs had been estimated at US\$87 to US\$90 a ton; and that efficient-operated plants could still enjoy a profit at prices between US\$82 and US\$84 a ton.

Due to the low prices that prevailed in July 1960, the Peruvian tax on exportation of fish meal was cancelled. This tax, based on a cost price of \$64.33 a ton, amounted to 10 percent on the difference between the officially-recognized production cost (\$64.33 per ton) and the price obtained in the United States (Pacific coast) after deduction of transportation and insurance expenses. There was also a tax of 10 percent ad valorem if the export sale price exceeded the officially-recognized cost price by 25 percent.

It was estimated that a plant capable of producing 2,000 tons of fish meal per month had a cost price of US\$64.33 per ton prior to July 1960. But the cost price of most plants was probably higher due to smaller capacity. In January of 1960, 63 plants were in operation; by July there were 74, with licenses requested for 12 additional plants.

There were 400 new vessels under construction as of November 1960.

Cost prices were estimated for plants of a capacity of 2,000 tons per month, operating under circumstances such as: (1) plants having their own boats, located along a quay, and working with an anchovy pump; (2) plants having their own boats, located in the interior, using an anchovy pump to load trucks for transporting the raw material; (3) plants not having boats, located along a quay, and using an anchovy pump; and (4) plants not having boats, located in the interior, and using an anchovy pump to load trucks for transporting the raw material. In (1), a cost price delivered in Europe (c. & f.) of US\$82.19 a ton was arrived at. For (2), cost price delivered in Europe would be US\$86.26 a ton. For (3), US\$84.49. For (4), \$88.56.

As of November 1960, Peru was offering fish meal for immediate delivery at US\$1.25 per protein unit, or US\$81.25 a ton. Contracts for delivery until the end of 1961 have been made on the basis of US\$1.14 to US\$1.15 per protein unit, or US\$74.10 and US\$74.75 per ton. As of November 1960, one could buy for delivery in 1961 at US\$1.19 per protein unit, or US\$77.35 per ton. (United States Consulate, Antwerp, November 22, 1960.)

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### FISH MEAL INDUSTRY TRENDS, THIRD QUARTER 1960:

During the July-September 1960 quarter, when anchovy fishing was at a seasonal low point for the year, many

## Peru (Contd.):

Peruvian fish meal producers improved their installations. One objective was the elimination of offensive odors which earlier in the year caused strong complaints from municipalities adjacent to fish meal plants. More important for the economic viewpoint, however, were improvements in the manufacturing process to reduce production costs, including renovation of existing operations and new installations. For example, in the short distance of about one-quarter of a mile along the shore to the north of Callao, at least three new plants were under construction during the third quarter, each initially with two or more production units capable of handling 40 to 50 tons of raw fish per hour, with additional units to be installed later. A feature of these plants is that anchovies can be unloaded by suction hoses, directly from the vessels. At least one of the plants has a laboratory for testing the quality of its product, radio equipment for communicating with vessels at sea, and an airplane for observation purposes. Heretofore, stickwater waste from the reduction process has been thrown away. Numerous plants are now installing equipment to treat stickwater for the recovery of valuable protein solids for addition to the fish meal during the manufacturing process. Such efforts to reduce production costs and to improve quality emphasize the determination of Peruvian producers to meet the challenge of reduced world prices in every way possible.

Fish meal prices continued at low levels during the third quarter, although they recovered to some extent as exporters sought to cover current contracts from available supplies. That activity drew to a close, however, and at the end of October, prices were running about \$66-\$68 a metric ton f.o.b. Peruvian ports for November delivery, \$64 for December delivery, and \$62 for January-June 1961 delivery.

While the continuous efforts of the Peruvian industry to initiate workable controls through self-imposed limitations of production or export have not yet been successful, there were indications at the end of October that a workable solution of the problem might be imminent. Certainly there appears to have developed a realization among Peruvian producers that controls must be instituted to avoid restrictions abroad and the possibility of chaotic conditions in the industry at home. Representatives of the Peruvian industry attended as observers the annual meeting of the International Association of Fish Meal Manufacturers held in Paris at the end of September. It is reported that Peru's leading supplier position in the world fish meal industry was recognized there, and agreement was reached that annual exports by Peru of 600,000 metric tons would be reasonable, would eliminate the uncertainties in the world markets caused by runaway Peruvian production, and would permit normal operation of world supply and demand factors, taking into account production of other supplying countries. Peruvian producers appear to have accepted the suggested 600,000-ton export figure, and to be prepared to adjust realistically to the necessity of regulating production to conform to it. It is understood that producers are working together to find ways and means of doing so. One plan mentioned would take into account production during November and December (seasonally good anchovy fishing months), and would give weight to historical sales patterns and to forward contracts. The Sociedad Nacional de Pesqueria, the industry's own organization, would control exports through a system of export permits. An initial step in the procedure was reportedly scheduled to be taken November 1, 1960, when all companies, in accordance with agreement, were to register their forward contracts with the Society. (U.S. Embassy, Lima, October 31, 1960.)

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EXPORTS OF FISHERY PRODUCTS,  
JANUARY-JUNE 1960:

Official Peruvian export data for fishery products for the first six months of 1960 as compared with the same period of 1959 show an increase of 109 percent in quantity and an increase of 52 percent in value. Fish meal exports increased 131 percent in quantity and 69 percent in value. There was a sharp decrease of frozen tuna (other than skipjack) exports (43 percent in quantity and value), reflecting the poor tuna fishing experienced in Peruvian waters. This has been attributed to abnormal water temperatures. Exports of canned tuna were also off.

Principal Peruvian Fishery Products Exports, January-June 1958-60						
Product	Quantity			Value <sup>1/</sup>		
	January-June			January-June		
	1960	1959	1958	1960	1959	1958
	... (Metric Tons) ...			... (US\$,1,000) ...		
Frozen Fish:						
Tuna . . .	4,094	7,210	3,674	463	847	430
Skipjack . .	4,440	1,643	983	452	193	113
Swordfish .	85	57	35	36	26	18
Shrimp (Lango- stinos) .	67	25	155	58	22	136
Total frozen	8,686	8,935	4,847	1,008	1,088	697
Canned Fish:						
Bonito . . .	7,534	7,727	5,849	2,705	3,073	2,234
Tuna . . .	261	420	501	87	130	158
Total canned	7,795	8,147	6,350	2,792	3,203	2,392
Fish By- products:						
Fish meal .	285,503	123,580	49,803	23,899	14,519	5,219
Fish oil . .	13,180	6,926	1,050	1,382	628	127
Sperm oil .	5,281	4,031	4,275	693	505	651
Whale meal	308	1,825	550	18	201	41
Total by- products .	304,272	136,362	55,678	25,932	15,853	6,038
Grand total	320,753	153,444	66,875	29,733	20,144	9,127

<sup>1/</sup> The average rate for U.S. dollars was 27.65 soles in the first half of 1960; 26.91 soles in the same period of 1959; and 22.11 soles in the first half of 1958.

\* \* \* \* \*

## SHRIMP INDUSTRY:

There are only two companies in Peru which freeze and export salt-water shrimp—one at Mancora and the other at Calea Cruz (Tumbes). A third company, located in Lima, acts as selling agent for both of them. All are Peruvian companies established with American capital. An official of the Lima company states that there has been no noteworthy changes in the shrimp industry during the past year. Two vessels have been added to the shrimp fleet, bringing the total number to 15. The landings for 1960 are being made at about the same rate per vessel as those for 1959, so the total landings in 1960 should be slightly higher than for 1959. He commented that the consumption of salt-water shrimp is increasing within Peru, but no data are available:

The Peruvian shrimp industry is limited to a narrow strip 30 miles long off the northern coast of Peru, near Tumbes and the shrimp are available all year. Normally the heaviest fishing takes place in May and June. In 1960, October and November have proved to be the months of heaviest fishing. The two companies are engaged in

## Peru (Contd.):

shrimp fishing and processing. The shrimp are beheaded on board the vessels and are frozen at their plants at Mancora and Caleta Cruz. No other type of processing of shrimp is done.

Shrimp landings for the 1956-59 period have varied between a high of 757,000 pounds heads-off in 1957 and a low of 268,000 pounds in 1959. Exports (all to the United States) during this period reached a peak of 736,000 pounds in 1957 and by 1959 had dropped to 268,000 pounds.

Table 1 - Peru's Landings and Exports of Shrimp, 1956-59 and January-September 1960

Year	Landings <sup>1/</sup>		Exports <sup>1/</sup>	
	Qty.		Qty.	Value <sup>2/</sup>
	1,000 Lbs.	1,000 Lbs.	1,000 Sols	US\$ 1,000
Jan.-Sept. 1960 . . . . .	2/	199	2,219	82
1959 . . . . .	268	185	1,960	71
1958 . . . . .	509	502	4,511	194
1957 . . . . .	757	736	5,695	302
1956 . . . . .	4/439	359	2,235	118

<sup>1/</sup>Headless weight.

<sup>2/</sup>Unavailable.

<sup>3/</sup>Average value of one sol: 1956 and 1957, \$0.053; 1958, \$0.043; 1959, \$0.036; and Jan.-Sept. 1960, \$0.037.

<sup>4/</sup>Revised.

The possibility of expanding the Peruvian shrimp fishery appears to be limited. It was estimated in 1955 that the present shrimp fishing area of Peru probably would not produce more than 600,000 to 900,000 pounds (heads-off) annually. Only in 1957 and 1959 were shrimp landings within this approximate range. At the end of 1959, an official of the Lima exporting firm characterized the Peruvian shrimp industry as "unfishing." Since the 1960 catch is reported to be only slightly ahead of 1959, it may be assumed that his reaction remains the same. (United States Embassy, Lima, November 14, 1960.)



## Ryukyu Islands

FISHING INDUSTRY EXPANSION PLAN  
DRAFTED BY JAPANESE:

The Japanese Fishery Agency towards the latter part of 1960 surveyed the Ryukyu Islands' fishing industry in order to develop a plan for Okinawa's fishing port. Made at the request of the Okinawan Government, the draft plan was completed in November 1960 and the Japanese agency expected to submit it to the Ryukyu Government shortly thereafter. The 5-year plan, which will cost some US\$1,666,667 a year and a total of \$7,900,000 for the five years, places emphasis on skipjack, tuna, sea bream, and mackerel fishing and calls for the establishment of a fisheries center around Naha. The major points of the plan are:

(1) A total catch of 37,000 metric tons is Okinawa's target for 1965 (it was 22,000 tons in 1958).

(2) Of the fishing vessels, 30 percent will be of the type for fishing skipjack and 13 percent for tuna. An increase of 50 percent is expected over the present 3,300 vessels. A 50-percent increase over 282 powered vessels is expected. Fish consumption is expected to reach 66 pounds per capita.

(3) A total of 16 fishing ports are planned. (Fisheries Economic News, November 8, 1960.)



## Spain

SALT COD EXPORTED TO  
PUERTO RICO FOR THE FIRST TIME:

Cod caught and processed by the Spanish fishing industry is now being exported for the first time, so far as is known. On November 24, 1960, a shipment of 4,200 cases of salt cod with a net weight of 200 metric tons were loaded at Pasajes, Guipuzcoa, and shipped to Puerto Rico.

Until recently, Spain has been importing from 60,000 to 80,000 metric tons of salt cod per year, from Canada, Iceland, and Scandinavian countries.

The ability to export cod has resulted from the expansion and modernization (which has been in progress since 1950) of the important fishing fleet at Pasajes, Guipuzcoa.

A press report has stated that Puerto Rico's annual requirement is about 500 tons, and that this significant shipment is the result of a recent visit of a group of Puerto Ricans to the Alvis Codfisheries Association at Pasajes. (American Consulate, Bilbao, Spain, November 30, 1960.)



## Sweden

## SHRIMP INDUSTRY, 1958-60:

The Swedish shrimp industry consists of 235 shrimp vessels, 756 fishermen, and 9 processing plants engaged in peeling and canning. Despite the fact that Sweden's exports of shrimp are sizable, nine-tenths of the catch is consumed domestically. Sweden is a net importer of shrimp, receiving most of it from Norway. Swedish shrimp-fishing is carried out in the North Sea. Because of the proximity of Norway, and the fact that the grounds, which are located essentially

## Sweden (Contd.):

in the vicinity of Oslofjord, are also a principal source of shrimp for the Norwegians, there has been conflict between Swedish and Norwegian fishermen as to the utilization of the shrimp grounds.

To preserve existing resources, the Swedish-Norwegian Fishing Agreement prescribes the amount of shrimp per week per vessel based on the size of the crew, and depending on whether for fresh consumption or processing purposes. The quantity allowed for processing is greater.

In 1958, Sweden's shrimp landings amounted to 2,147 metric tons valued at US\$2,095,061. The heaviest landings were during September and October. Shrimp are taken throughout the year and there is no pattern in the monthly variations of landings.

Initial processing of shrimp takes place aboard the vessel and consists of boiling in brine. All shrimp more than 3½ inches in length and those smaller ones not destined for canning are handled in this manner. There is no freezing of shrimp in Sweden. But the major Swedish food processing firm does freeze shrimp for the Swedish and other markets in their Danish plants.

Shrimp processing in Sweden is confined to deveining and canning at 9 plants along the Swedish west coast. Of these, 7 purchased 1,150 metric tons of boiled shrimp in 1959--peeled or packed it in glass or tin cans with a processors' sales value of US\$1,222,899. Only one plant was using peeling machinery. Retail prices for 100 grams (3.5 ounces) of shrimp packed in glass ranged from Kr. 1.75-2.50 (34-48 U. S. cents). Shrimp packed in cans retailed at 125 grams (4.4 ozs.) for Kr. 1.55 (30 cents), and 100 grams (3.5 ozs.) for Kr. 1.33 (26 cents) a can. 1/

The overwhelming proportion of the shrimp caught by Swedish fishermen are the species "Pandalus borealis," called "Nordhavsrakor." A small quantity (2 tons in 1958) of *Leander adpersus* also is caught for domestic consumption.

In 1957, Sweden's shrimp landings (heads-on weight) amounted to 2,124 metric tons valued at 10.9 million kr. (US\$2,106,207); in 1958, 2,154 tons valued at 10.9 million kr.

1/Prices effective November 1960. Export prices 30-35 percent lower.

(US\$2,106,207); and in 1959, 3,214 tons valued at 13.8 million kr. (US\$2,667,126).

Of these totals 1,000 metric tons in 1957 and 1958 were used for canning, while in 1959 1,200 tons were used. The estimated quantity canned in 1960 may total 1,400 metric tons. The remainder is sold for "fresh consumption."

The count of heads-on shrimp per kilo sold for fresh consumption averages between 140-180 (64-82 per pound) while the count per kilo used by canneries averages 240 to 260 (109-118 per pound).

The number of vessels engaged in shrimp fishing in 1958 totalled 235, employing 756 fishermen. The value of the boats amounted to 8.3 million kronor (US\$1,603,809). The number of trawlers has increased in the past few years to 280. The size of the trawlers ranges from 40 to 60 feet, the smallest employs two fishermen, the largest four. Modern vessels are equipped with Diesel engines between 150-200 hp. Older vessels are equipped with raw oil motors averaging 100 hp, each.

According to the Agricultural Marketing Board (*Jordbruksnamnden*), the ownership pattern of the vessels and tackle employed in shrimp fishing is the same as the pattern generally found in the Swedish fishing industry. The vessel and equipment are the property of the fishermen themselves, owned locally. Those who are neither owners nor part-owners are usually not wage-earners either, but members of a "fishing team" formed by all those on board. Net income of the vessel is divided into shares, some going to members of the crew and some to part-owners and owners. The annual total income for each team is estimated at 50,000 kr. (US\$9,664).

In Sweden shrimp are sold in lots through a sub-organization of the West Coast Fishermen's Central Association and at a minimum price of 1.75 kr. per kilo (15 U.S. cents per pound). Unsold shrimp are retained by the

Type	Quantity		Value	
	Metric Tons	1,000 Sw. Kr.	US\$	1,000
Boiled and fresh . . . . .	246	521	101	
Canned . . . . .	65	813	157	
Otherwise processed <sup>1/</sup> . . . . .	2	53	10	
Total . . . . .	313	1,387	268	

1/Frozen shrimp imported from Denmark and subsequently re-exported.  
Note: Include landings abroad by Swedish shrimp fishermen.

## Sweden (Contd.):

association at 1.65 kr. per kilo (15 U.S. cents per pound). From the public sales price, 5 ore per kilo (US\$8.77 per short ton) is deducted by the association for the maintenance of the guaranteed sales price, and one ore per kilo for the administration of the organization.

There are no export controls or special taxes affecting the Swedish shrimp industry other than quality and sanitary controls.

Table 2 - Swedish Exports of Shrimp, 1959<sup>1/</sup>, by Type and Principal Country of Destination

Type	Destination	Quantity		Value	
		Metric Tons	Sw. Kr.	100 Sw. Kr.	US\$ 1,000
Boiled and Fresh	Norway	91	16.8	3.2	
	Denmark	155	32.1	6.3	
	Others	-	3.3	0.6	
	Denmark	4	5.3	1.0	
Canned	Great Britain	34	42.9	8.4	
	Italy	4	5.4	1.0	
	Switzerland	3	5.3	1.0	
	Austria	3	4.9	0.9	
	U.S.A.	3	5.3	1.0	
	Others	4	7.0	1.4	
Total		301	128.3	24.8	
<sup>1/</sup> Preliminary.					

Products prepared by the plants are subject to control by a Government organization under the Agricultural Marketing Board. The plants are required to provide the control organization upon demand with samples of prepared products. The organization checks the quality as against the label, and certifies its reliability.

The charge for the service is negligible.

The control organization also handles the inspection of plants, raw material, processing method and equipment, and sanitary conditions at all stages of the canning operation.

The shrimp industry does not receive a Government subsidy, nor is any under consideration.

The male and female workers in the processing plants are generally part-time workers, called upon when sufficient shrimp is landed. Most women employed are near-by housewives. Some employers pay for each phase of processing separately, others for the entire process, mostly at piece rates.

The workers are unionized and earn approximately 4 kr. (77 U.S. cents) per hour.

Shrimp fishing is carried out three days each week; the remaining workweek is devoted to other types of fishing.

Swedish fishermen are members of the Swedish Fishermen's Unemployment Fund.

As of November 1960 there were no plans for the expansion of either the catch of shrimp or the volume of exports. Expansion by types or species exported is unlikely as only two principal species exist on the Swedish shrimp grounds. Expansion of exports to the United States are unlikely; only 3 metric tons were exported in 1959. (American Embassy, Stockholm, November 23, 1960.)

Note: Values converted at rate of: 1957-58--5.175 Sw. Kr. equal US\$1; 1959-60--5.174 Sw. Kr. equal US\$1.



## Taiwan

### SHRIMP INDUSTRY:

The major shrimp fishing grounds of Taiwan are off the coast of southwestern Taiwan from Yunlin to Kaohsiung, waters west of Penghu (Pescadore Islands), and the northern part of the Taiwan Strait. Shrimp are caught year-around, but the best season is March-May. During those months 50 percent of the annual catch is landed.

All the shrimp landed in Taiwan are consumed locally. Large and medium shrimp are shipped with ice from producing centers to consuming centers such as Taipei, Taichung, Tainan, and Kaohsiung. They are used mostly by restaurants and hotels, as the price is too high for the average family. Small shrimp are consumed by both rural and urban families either fresh or dried. Dried shrimp are processed by boiling and then sun-drying. About 4-7 percent of the annual landings are dried. No frozen shrimp has been processed, although there are a few refrigeration plants with enough freezing capacity at Keelung and Kaohsiung. There has been no canning of shrimp. The extent of mechanization in shrimp processing will depend largely on the prospect of export; there has been no discernible trend toward such mechanization.

The production of shrimp (heads-on) in Taiwan in recent years is as follows: estimated 6,000 metric tons for 1960; 5,111 tons for 1959; 4,058 tons for 1958; 3,822 tons for 1957; and 3,858 tons for 1956. Shrimp landings have increased rather sharply since 1958. Of the total production in 1958, 70 percent was caught by small trawlers in the inshore waters of the southwestern part of Taiwan, 10 percent was caught by various kinds of fishing methods such as swing-bell net or stick-held net along the coast, 15 percent was produced by culture in brackish-water fish ponds located in the southwestern part of Taiwan, and the remaining 5 percent was landed by deep-sea trawlers.

There are more than a dozen species of shrimp produced in Taiwan. The major species are: red shrimp (*Penaeopsis acclivis*), thick-shell shrimp (*Penaeopsis akayebi*), sand shrimp (*Penaeopsis monoceros*), striped shrimp (*Penaeus japonicus*), bright shrimp (*Basidaphnia slyado*), and grass shrimp (*Penaeus carinatus*). Shrimp are graded as large, medium, and small. For large shrimp (mostly striped shrimp and grass shrimp), there are fewer than 20 heads-on shrimp per pound. Medium shrimp (mostly thick-shell shrimp, red shrimp, and

## Taiwan (Contd.):

sand shrimp) run between 30 and 40 to the pound. Small shrimp (various species) run more than 40 per pound. Of the total shrimp production (heads-on), large shrimp account for about 10 percent, medium shrimp 40 percent, and small shrimp 50 percent.

There are about 800 shrimp trawlers of 5-10 tons, with 22-30 hp. engines, operating in the waters of Taiwan. Most of these vessels make one-day trips, but a few make seven-day trips to the inshore waters of Penghu. There is no overall planning for vessel construction nor for expansion of the present fleet.

Exporters in Taiwan have studied the possibilities of exporting frozen shrimp to the United States, but the high prices on the local market is the major deterrent to such attempts. The current wholesale price of large shrimp is about NT\$80-80 per kilogram (88-90 U.S. cents a pound), which is higher than the market price in the United States.

The current wage rate for processing dried shrimp is in the range NT\$400-600 (US\$10-15) a month.

Fishermen who work as employees are paid a monthly wage plus a bonus which is calculated by comparing the actual monthly catch with the average. There are also a number of fishermen-owners.

According to fishery specialists of the Sino-American Joint Commission on Rural Reconstruction (JCRR), the production of medium and small shrimp could be increased substantially from waters around Taiwan, were the demand to rise. However, to increase the production of an exportable type of shrimp would not be easy. There may be fine quality shrimp of a size suitable for the United States market or other foreign markets in the Strait of Taiwan, but much exploratory fishing would be needed before this could be established, and it would probably take 2 or 3 years before Taiwan could become a significant exporter of shrimp, even if the decision were taken to promote such a project. (United States Embassy in Taipei, November 23, 1960.)



## Thailand

SHRIMP INDUSTRY:

The inland, or fresh-water shrimp industry of Thailand consists mostly of fresh-water prawn; 90 percent is distributed either fresh or frozen, and the remaining 10 percent either salted or cooked. The principal inland shrimp fishing grounds are located in central Thailand. The most favorable season for catching fresh-water prawn is December-February, when the high tides of the river ebb. During this period, 8 to 15-tons of prawn are caught daily.

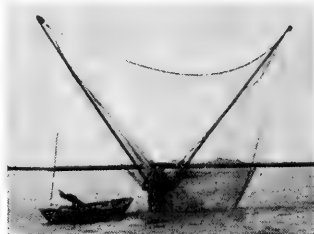
The sea, or brackish-water, shrimp industry consists mainly of white shrimp. The small sizes are sold salted or cooked. Only a small amount of shrimp paste is produced because of the high manufacturing cost.

The brackish-water shrimp industry is located at almost every major river delta

along the Gulf of Thailand. Fishing is inactive during the monsoon season, July-September. The brackish-water shrimp grounds are also found along the coast, but the most important area is on a line extending from Chumporn to the southernmost tip of Thai territorial waters.

The Government-owned "Cold Storage Organization" in Bangkok is the only plant processing frozen shrimp. Washing, peeling and beheading is done by modern machines.

New freezing plants for processing fish at Chumporn and Songkhla are planned. Facilities for processing shrimp will be incorporated. When completed, they should be able to take care of south Thailand's fish- and shrimp-processing requirements.



Shrimp fishing in shallow water in Thailand.

The total catch of shrimp for 1960 was estimated at not less than 2,000 metric tons, heads-on weight. Unofficially, landings were 5,000 metric tons in 1956; 4,000 in 1957; 4,000 in 1958; and 3,000 in 1959. Fresh shrimp lose 42 percent their weight when beheaded, and 60 percent when peeled. The two most commonly found species of shrimp are white shrimp and spotted shrimp.

There are approximately 200 fishing vessels of 20 gross tons each. Most are equipped with 60 hp. engines. Expanding the number of shrimp fishing vessels is not under consideration. The greater part of the shrimp fishing fleet is owned by Thai nationals; some of the vessels are built locally, but a considerable number are foreign made.

The export price of headless shrimp averaged about US\$1 a pound in 1958 and US\$0.85 in 1959. Most exports were to Malaya.

Exports of frozen shrimp by the "Cold Storage Organization" averaged 100 metric tons in 1958 and 250 tons in 1959. The total value for the two years was about 1 million Baht (approximately US\$48,000). There were no exports in 1956 or in 1957. Some exports of frozen shrimp were made to Malaya, but none to the United States nor Europe during the first ten months of 1960.

**Thailand (Contd.):**

There is no subsidy, export duty, or export controls on shrimp.

The cost of processing and packaging frozen shrimp amounts to about 1:50 Baht per kilogram (approximately 3 U.S. cents per lb.).

Payment to shrimp fishermen is by cash only. The average net income of the shrimp fishermen is about 40,000 Baht (US\$1,905) per annum, the lowest gross income is about 10,000 Baht (US\$476) and the highest about 100,000 Baht (US\$4,762). In an exceptionally good season, some are able to gross as much as 80,000-90,000 Baht (US\$3,810-4,286) per month. Expenses incurred in shrimp fishing are comparatively lower than other types of fishing. Total labor required is about 6 to 20 persons, and most equipment is locally produced other than the fishing vessels.

The Government of Thailand would like to expand the existing shrimp industry, but no plans exist. The types of shrimp which are exported to all countries as well as the United States are known as white shrimp and spotted shrimp. However, according to marketing circles, white shrimp is preferred over spotted shrimp in the United States. There appears to be little present possibility of physically expanding existing shrimp catches or of meeting many foreign requirements save that of Malaya: (American Embassy, Bangkok, December 2, 1960.)

Note: Values converted at rate of 21 Baht equal US\$1.

**Trinidad****SHRIMP INDUSTRY:**

The shrimp industry in Trinidad as of November 1960 is relatively small. Shrimp are generally caught during the first half of the year by small boats and by beach seining. Virtually all of the local shrimp catch is consumed fresh. There is only one 68-foot Diesel-engine shrimp vessel operating in Trinidad, which was recently purchased in Florida. This vessel also has been fishing for finfish.

The landing of shrimp in the Leeward and Windward Islands is negligible and there is no statistical data available to supply any details.

A Florida-owned company registered in Trinidad has ceased operations in Trinidad. The company started operating in Trinidad in May 1960, packing and freezing shrimp for export. A fleet of 12 to 15 United States-owned shrimp trawlers fished in waters off Surinam to provide the Trinidad plant with shrimp. The total catch from May through October amounted to about 300,000 pounds, which were cleaned, sorted, and exported to the United States. The only machinery used was a grader and a stapling machine; all other labor was done by hand.

Precise data on the local catch of shrimp is not available because of the small size of the fishery. In 1957 about 300,000 pounds of shrimp were caught and marketed in Trinidad.

The Florida-owned company while fishing off Surinam caught pink or brown shrimp. About one-quarter of the pack consisted of less than 15 shrimp to a pound, about half the pack of 15-20 count, and one quarter, 21 to 25 count.

There has been some discussion that a Trinidad subsidiary of a New York City firm may enter into an operation similar to that of the Florida-owned company. The Trinidad subsidiary of the New York City firm is constructing a cold-storage and freezing plant.

There are no current export controls, subsidies, or taxes on shrimp fishing, processing, and exporting in Trinidad.

The Florida-owned company which has ceased operating in Trinidad, employed 40-50 people in its plant and paid an average of about 60 BWT cents per hour (about 35.5 U.S. cents).

This firm paid United States vessels on the basis of shrimp prices in the United States less the costs of processing, freight to the United States, and insurance. A large part of the catch by local fishermen is sold at retail in Trinidad.

There does not seem to be any possibility of expanding the grounds for shrimp located close to Trinidad, which are not extensive.

The possibility always exists that another operation similar to that of the Florida-owned company will be established in Trinidad to pack and export shrimp catches from waters off the Guianas. The main reason for that company's failure was the desire of the United States vessel owners to return to the United States. (U.S. Consulate General, Port of Spain, November 25, 1960.)

**Tunisia****PURCHASE OF TWO  
TUNA FISHING VESSELS  
UNDER CONSIDERATION:**

The Tunisian National Fisheries Office announced during the third quarter of 1960 that it is investigating the possibility of purchasing two ocean-going tuna clippers, the total cost of which would be about 400,000 dinars (about US\$952,000). These clippers would be used to fish the Atlantic off the west coast of Africa and the catch would be used to supply Tunisia's canneries. These canneries have, partly because of a disappointing tuna season, become regular importers of Japanese Atlantic-caught tuna for canning.

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**SHRIMP INDUSTRY**

Shrimp catches by Tunisian fishermen are made incidental to trawling operations for miscellaneous groundfish. However, the shrimp catch does contribute to the economy of the trawling fleet, since they command a relatively high price, ranging from 375 millimes (US\$0.90) to 1,000 millimes (US\$2.38) a kilogram (about US\$0.41-1.08 a pound) heads on.



## Tunisia (Contd.):

Landings of heads-on shrimp for the years 1956-59 varied between a high of 200 metric tons in 1956 and a low of 103 tons in 1959. For the first six months of 1960 landings amounted to 132 tons. There are two principal types or species taken by Tunisian fishermen—royal or red (*Aristomorpha*) and rose (*Parapaneus*). About 98 percent of the royal or red shrimp are larger than 40 count (heads-on) to the pound and about 92 percent of the rose shrimp are 40 count or larger. About 60 percent of the two shrimp types are 30 count or larger. Although taken throughout the year, shrimp are landed in commercial quantities in Tunisia only during the summer months, May through August.

There is only one processing plant at this time in Tunisia, located 7 miles north of the City of Tunis. This French-owned freezing plant is one of a chain of six which extends from Spain through North Africa to Tunisia, and which has its own retail sales outlets in France. The plant packs unpeeled whole cooked shrimp in one-kilogram (2.2 lbs.) cartons; very small and broken shrimp are peeled and packed in small polyethylene bags prior to freezing.

The packing operation of this single Tunisian plant is performed entirely by hand. However, the product is considered to be of excellent quality and well packaged. With the small output and declining supplies, it is unlikely that any effort toward mechanization will be made in the foreseeable future.

There are 60 vessels in the Tunisian trawler fleet, of which approximately 15 deliver the bulk of the shrimp catch. These vessels range in size from about 50 to 85 feet with a horsepower range of from 75 to 275.

The Government-financed fishery enterprise (Office National des Peches) has acquired a shipyard site in the Tunis port area, and employed a Yugoslav shipbuilding expert, with the intention of constructing wood and steel fishing vessels, 60 to 70 feet in length. It is understood that the British-Maltese interests have also been enlisted in the project. However, there is some question as to whether the undertaking will actually materialize in the near future.

At the moment, four International Cooperation Administration-financed 20-meter (65 foot) trawlers, built in Italy, were scheduled for delivery late in 1960, and were the only known future additions to the fleet.

The entire fishing fleet is Tunisian owned. During 1956, 1957, and 1958, four Italian vessels were licensed to deliver only shrimp for processing at the local freezing plant (the fish catch was delivered in Sicily). However, this procedure has been discontinued as a result of Tunisian-Italian friction over fishing rights in Tunisian coastal waters.

Export prices for shrimp are available only for the years 1958 and 1959, when they were Dinars 690 and Dinars 614 (about US\$1,642.20 to \$1,461.32) per metric ton, respectively.

Exports all frozen and heads on, except for small and broken shrimp: 1956, 188 tons (includes 18.5 tons delivered by Italians); 1957, 136 tons (includes 63 tons delivered by Italians); 1958, 254 tons (includes 82 tons delivered by Italians); 1959, 87 tons; and 1960, 142 tons (for entire year).

About all of the above were exported to France, with a very small quantity going to Switzerland. (Discrepancies will be noted between these figures and the statistics on landings. These are probably attributable to landings which were not calculated in the Tunisian statistics. The Service des Statistiques of the Government of Tunisia lists exports of 194.7 and 85.2 metric tons for the years 1958 and 1959.)

Currently, there are no Tunisian export controls, subsidies, or taxes on the local shrimp industry. Wage rates for processing are 72 millimes or about 17 U.S. cents an

hour while actually employed. May through August. Fishermen are paid on a share basis, except for those on Government-operated vessels. Earnings average approximately \$50 a month, only a part of which is represented by the catch of shrimp. There are extra fringe benefits, such as health insurance, family bonuses, etc.

Provided that the Tunisian fishermen are willing to go further offshore in their operations, the possibility of increasing the total shrimp catch is good. However, even if the present small catch were doubled, the yield would still not be of commercially-significant proportions. It seems unlikely that the catch of the Tunisian fleet, under the best possible conditions, would exceed this doubled amount in the foreseeable future. (United States Embassy, Tunis, November 21, 1960.)

Note: Values converted at rate of 1 dinar equals US\$2.38.



## Union of South Africa

### PARTICIPATES IN INTERNATIONAL INDIAN OCEAN EXPEDITION:

South African scientific organizations will pursue various projects as their contribution to the SCOR (Special Committee for Oceanic Research) International Indian Ocean Expedition. Scientists from the United States are also participating.

The main international effort will take place in 1962 and 1963, and data analysis will continue beyond the end of the expedition in 1964. The Indian Ocean survey was selected by SCOR because it is the least known of the oceans. It also has unique oceanographic problems. There is evidence that it is a highly productive ocean, which makes this project of great commercial significance.

The South African projects will take place from Cape Agulhas east to Delagoa Bay, up to 950-1,000 miles from the African coast. Two South African research ships are available.

One group will sail during June-July 1961, from Delagoa Bay to a point south of Madagascar, then southeast to long. 58° E, lat. 37° S, and then straight back on the African coast to a lat. 32° S. The same cruise may be repeated in 1962.

Another group will sail from Delagoa Bay, along lat. 27° S, as far as long. 43° E, then due south and back along lat. 32° S. This will be done once in winter and once in summer, probably in 1962. While Japanese have fished the waters north of Madagascar and may have done exploratory fishing south

### Union of South Africa (Contd.):

of the Island, the fishing potentialities in those waters are really unknown. They hope to locate an "upwelling" (a current carrying rich nutrients off the sea bottom towards the surface) at the southern tip of Madagascar and over a bank somewhere along the track described above. This could mean the discovery of rich feeding grounds for tuna.

The University of Cape Town's Oceanography Department is working on studies concerning the relationship between water temperatures and currents, and plankton distribution and the whereabouts of tuna, in the hope of discovering ocean conditions where tuna can predictably be found. Theories developed will be tested during the expedition. (American Consul, Cape Town, October 28, 1960.)



### U. S. S. R.

#### EXPANSION OF FISHING AND WHALING FLEETS CONTINUES:

The first of a series of vessels for fishing in the tropics is now under construction at the East German Baltic Port of Stralsund. Over 60 have been ordered by the Soviets.

Called Tropyk class, they are East German-designed, 80 meters (282.4 feet) overall with a beam of 13 meters (42.6 feet). They will be equipped with refrigerating plant and used mainly for sardine, herring, and tuna fishing. The first vessel will be handed over in December 1961.

What is claimed to be the world's biggest factory whaler, the Sovetskaya Rossiya, is being completed at the Nikolayev shipyards in Russia. The Sovetskaya Rossiya is an ocean-going three-decker, 217.8 meters (714 feet) over-all.

Her displacement is 45,000 tons, design speed 17.5 knots, and she has a cruising range of over 9,000 miles. The ship will be powered by two 75,000 hp. engines. There will be facilities to process several thousand whales during a season and to make 100 percent use of whale meat, bone, and blubber. The whaler will have 950 electric motors with a combined power output of 15,000 kw., and stabilizing tanks to reduce the ship's rolling by half.

She will sail on her maiden voyage in 1961 and will work in Antarctic waters in company with the Slava, Sovetskaya Ukraina, and Yuriy Dolgoruki whaling fleets. (Fishing News, November 11, 1960.)

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#### LANDINGS OF FISHERY PRODUCTS, 1956-59:

A Soviet Union statistical yearbook for 1959 reports the total landings of "fish, marine animals, and whales" as about 6.8 billion pounds in 1959, according to the November 10 issue of Fiskets Gang, a Norwegian fishery trade periodical. This represents an increase of about 4.7 percent as compared with 1958. An increase of 10 percent was planned for 1960.

Country	1959	1958	1957	1956
	. . . . . (Million Pounds) . . . . .			
RSFSR (Russia proper) . . .	4,960	4,821	4,621	4,857
Lithuania . . . . .	231	207	187	163
Latvia . . . . .	231	209	183	146
Estonia . . . . .	159	128	128	139
Other . . . . .	1,198	1,108	968	976
Total . . . . .	6,779	6,473	6,087	6,281

The Russian Republic accounts for almost three quarters of the landings and the Baltic Republics for 9 percent.



### Uruguay

#### SHRIMP INDUSTRY:

The Uruguayan shrimp fishery is conducted exclusively in brackish lakes and marshes located along Uruguay's Atlantic coast. Since no open-sea fishing is attempted, at present the shrimp industry does not come under the control of Government of Uruguay fishing monopoly (SOYP), which controls all ocean fisheries. The fishing fleet consists of small boats owned and operated by private interests. The Government monopoly hopes eventually to fish for shrimp and to that end has recently requested (in conjunction with Brazil and Argentina) through the Food and Agriculture Organization the services of a shrimp biology expert. At present the monopoly has neither the equipment nor the technical know-how for a shrimp fishery.

Shrimp fishing is normally limited to the months of March and April. Annual landings vary from about 77,000 pounds during good seasons to as little as 9,000 pounds during

## Uruguay (Contd.):



poor seasons. The major determining factor in the size of the landings is the extent to which channels are opened from the ocean to the lakes to allow the free passage of salt water. Production does not normally supply domestic needs and no shrimp are exported. Most of the shrimp are marketed fresh in seaside resort towns (principally Punta del Este) and in Montevideo. The remaining small amount is peeled and canned at Government facilities for the local market.

The Government fish monopoly's future plans for expanding the shrimp fishery and perhaps entering the export market depend on the results of the survey to be made by the FAO shrimp biologist. (American Embassy, Montevideo, November 9, 1960.)



#### MINIMUM STOCK FOR ATLANTIC SALMON STREAM

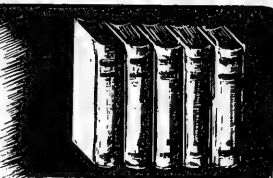
An interesting article in the September 1960 issue of *The Atlantic Salmon Journal* (Fredericton, New Brunswick) discussed the basic question, "How many Atlantic Salmon does a river need to keep up the stock?" It is drawn from a report by Dr. P. F. Elson, St. Andrews (N. B.) biological Station of the Canadian Department of Fisheries.

Based on research data presently available from several salmon streams under study in New Brunswick, the conclusion was reached by Dr. Elson that the number of adult Atlantic salmon required to maintain stocks is between 40 and 50 pounds of adult females per mile of stream 10 yards wide. He also concludes that the presence of more broodstock or the stocking of hatchery products in excess of natural production resulting from this minimum of brood stock will yield little or no advantage to the resulting fishery.

On the other hand, recent forest spraying with DDT in the watersheds of some of these waters have seriously reduced the naturally-produced stocks of young. Under these circumstances, carefully planned use of hatchery products seems to Dr. Elson to be one way of getting better salmon production.



# FEDERAL ACTIONS



## Department of the Interior

FISH AND WILDLIFE SERVICE

BUREAU OF COMMERCIAL FISHERIES

### FROZEN OCEAN PERCH AND PACIFIC OCEAN PERCH FILLETS VOLUNTARY GRADE STANDARDS ISSUED:

Voluntary standards for the production of good quality frozen ocean perch and Pacific ocean perch fillets became effective January 22, 1961. Notice of the promulgation of these standards was carried in the Federal Register of December 23, 1960.

Notice of intention to establish the proposed standards was carried in the Federal Register of October 21, 1960. Interested persons were given until November 20, 1960, to submit written comments, suggestions or objections, to the proposed standards. No comments, suggestions or objections were received.

Products which conform to these standards are readily identifiable to the consumer. Firms which have continuous inspection are entitled to mark their packages with the Federal shield. Those which subscribe only to sample inspection may certify that the product meets the requirements of the grade specified but cannot use the prefix "U.S." nor the shield.

The standards for ocean perch (*Sebastes marinus*) and Pacific ocean perch (*Sebastes alutus*) fillets apply to clean, whole, wholesome fillets, cut away from either side of the fish, which are packaged and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product. The standards include product description, grades, recommended weights and dimensions, factors of quality, definitions and methods of analysis, lot certification tolerances, and score sheet. The grades include "U.S. Grade A" and "U.S. Grade B." Quality below these grades would be classified as substandard.

The standards do not define proper labeling for this product. Frozen ocean perch and

Pacific ocean perch fillets, when sold in interstate commerce, must conform to the labeling regulations of the Food and Drug Administration, U. S. Department of Health, Education, and Welfare.

Funds made available by Public Law 466 (83rd Congress), commonly referred to as the Saltonstall-Kennedy Act, have been used to expedite progress on the Bureau's program for the development of voluntary Federal standards. The National Fisheries Institute, acting as contract research agency for the Bureau, has supplied the industry liaison essential to the standards program and has furnished consulting services at meetings and conferences on the standards. A committee of industry technologists, representatives of both producers and distributors, actively cooperated with the Bureau's scientific staff in the development of realistic and practical standards. The standards as they appeared in the Federal Register of December 23, 1960, follow:

## Title 50—WILDLIFE

Chapter II - Bureau of Commercial Fisheries,  
Fish and Wildlife Service,  
Department of the Interior

SUBCHAPTER C—PROCESSED FISHERY PRODUCTS, PROCESSED PRODUCTS THEREOF, AND CERTAIN OTHER PROCESSED FOOD PRODUCTS	Sec.	PRODUCT DESCRIPTION AND GRADES
<b>PART 269—UNITED STATES STANDARDS FOR GRADES OF FROZEN OCEAN-PERCH FILLETS AND FROZEN PACIFIC OCEAN-PERCH FILLETS<sup>1</sup></b>	269.1	Product description.
	269.2	Grades of frozen ocean-perch fillets.
		<b>WEIGHTS AND DIMENSIONS</b>
	269.6	Recommended weights and dimensions.
		<b>FACTORS OF QUALITY</b>
	269.11	Ascertaining the grade.
	269.12	Evaluation of the unscored factor of flavor and odor.
	269.13	Evaluation and rating of the scored factors: Appearance, size, absence of defects, and character.
	269.14	Appearance.
	269.15	Size.
	269.16	Absence of defects.
	269.17	Character.
		<b>DEFINITIONS AND METHODS OF ANALYSIS</b>
	269.21	Cooking in a suitable manner.
		<b>LOT CERTIFICATION TOLERANCES</b>
	269.25	Tolerances for certification of officially drawn samples.
		<b>SCORE SHEET</b>
	269.31	Score sheet for frozen ocean-perch fillets.

On October 21, 1960, a notice and text of a proposed new Part 269 of Title 50, Code of Federal Regulations was published in the FEDERAL REGISTER (25 F.R. 10064). The purpose of the new part is to issue United States Standards for Grades of Frozen Ocean-perch Fillets and Frozen Pacific Ocean-perch Fillets under the authority transferred to the U.S. 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 November 20, 1960, to submit written comments, suggestions or objections with respect to the proposed new part. No comments, suggestions or objections have been received. The proposed new part is hereby adopted without change and is set forth below. This part shall become effective 30 days after publication in the FEDERAL REGISTER.

<sup>1</sup> Compliance with the provisions of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act.

AUTHORITY: 16 USC 1 to 269-31 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 AND GRADES**

**§ 269.1 Product description.**  
The product described in this part consists of: (a) Clean, whole, wholesome filets, cut away from either side of the ocean perch, Sebastes marinus, which are packaged and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product; (b) Clean, whole, wholesome filets, cut away from either side of the Pacific ocean perch, Sebastes albus, which are packaged and frozen in accordance with good commercial practice and are maintained at temperatures necessary for the preservation of the product.

**§ 269.2 Grades of frozen ocean-perch filets.**

(a) "U.S. Grade A" is the quality of frozen ocean-perch filets that possess good flavor and odor; and for those factors of quality which are rated in accordance with the scoring system outlined in this part the total score is not less than 85 points.

"U.S. Grade B" is the quality of frozen ocean-perch filets that possess at least reasonably good flavor and odor; and for those factors of quality which are rated in accordance with the scoring system outlined in this part the total score is not less than 70 points.

**WEIGHTS AND DIMENSIONS**

**§ 269.6 Recommended weights and dimensions.**

(a) The net weights and dimensions of packaged frozen ocean-perch filets and Pacific ocean-perch filets are not incorporated in the grades of the finished product since net weights and dimensions, as such, are not factors of quality for these purposes.

(b) It is recommended that the net weight of the packaged frozen ocean-perch filets and Pacific ocean-perch filets be not less than 12 ounces and not over 10 pounds and that the product be classified as large, medium, or small as defined by common commercial size classification practices.

**FACTORS OF QUALITY**

**§ 269.11 Ascertaining the grade.**

The grade of frozen ocean-perch filets in the frozen, thawed, and cooked states. The following factors of quality are evaluated in ascertaining the grade of the product: Flavor and odor, appearance, size, absence of defects, and character. These factors are rated in the following manner:

(1) **Flavor and odor.** This factor is rated directly by organoleptic evaluation. Score points are not associated (see § 269.12).

(2) **Appearance, size, absence of defects, and character.** The relative importance of these factors is expressed numerically on the scale of 100. The maximum number of points that may be given each of these factors are:

Flavor	Points
Appearance	20
Size	15
Absence of defects	20
Character	25
<b>Total possible score</b>	<b>100</b>

**§ 269.12 Evaluation of the uncooked factor of flavor and odor.**

(a) **Good flavor and odor.** "Good flavor and odor" (essential requirement for a Grade A product) means that the fish flesh has good flavor and odor characteristic of the species (either Sebastes marinus or Sebastes albus) and is free from staleness, and off-flavors and off-odors of any kind.

(b) **Reasonably good flavor and odor.** "Reasonably good flavor and odor" (minimum requirement for a Grade B product) means that the fish flesh may be slightly lacking in good flavor and odor; and is free from objectionable off-flavors and off-odors of any kind.

**§ 269.13 Evaluation and rating of the scored factors: Appearance, size, absence of defects, and character.**

The essential variations in quality within each factor which is scored are so described that the value may be ascertained for each factor and expressed numerically. Point deductions are allotted for each degree or amount of variation within each factor. The net score for each factor is the maximum points for that factor less the sum of the deduction-points within the factor. The total score for the product is the sum of the net scores for the four scored factors.

**§ 269.14 Appearance.**

(a) The factor of appearance refers to the color of the frozen fish flesh, and to the degree and amount of surface dehydration of the frozen product.

(b) For the purpose of rating the factor of appearance the schedule of deduction-points in Table I apply. Frozen ocean-perch filets which receive 15 deduction points for the factor of appearance shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE I—SCORED DEDUCTIONS FOR APPEARANCE

Color of frozen product	Deduction points	Surface area affected (percent)	
		Over	Not over
No discoloration	0	0	0
Slight yellowing	0	0	0
Moderate yellowing	0	0	0
Excessive yellowing and/or discoloration	15	0	0
Degree of dehydration of frozen product			
Slight—Shallow and not color non-uniform	0	0	0
Moderate—1 inch, but just deep enough to be easily discernible	0	0	0
Excessive—Deep dehydration, not easily sawed off.	15	0	0

**§ 269.15 Size.**

(a) The factor of size refers to the degree of freedom from undrastically small filets.

(b) For the purpose of rating the factor of size, the schedule of deduction-points in Table II apply. Ocean-perch filets which receive 20 deduction-points for this factor shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE II—SCORE DEDUCTIONS FOR SIZE OF FILETS

Number of small filets or pieces of filets	Number of filets per pound										
	0	1	2	3	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0

**§ 269.16 Absence of defects.**

(a) The factor of "absence of defects" refers to the degree of freedom from improper packing, cutting and trimming, blemishes, and bones. Evaluation for the defect of improper packing is made on the frozen product. Evaluation of the defects of cutting and trimming, blemishes, and bones are made on the thawed product.

(1) **Improper packing.** "Improper packing" means poor arrangement of filets, presence of voids, depressions, frost, and the imbedding of packaging material into the frozen fish flesh.

(2) **Cutting and trimming imperfections.** "Cutting and trimming imperfections" means that the thawed filets are ragged edged, have holes, or are otherwise improperly cut or trimmed.

(3) **Blemish.** "Blemish" means an instance of blood-spots, bruise, black-belly lining, membrane, fin, scales, or extraneous material. Blemish also means an instance of skin on skinned fillets. One "instance of blood spot" is one of such size and prominence as to be considered objectionable. An "instance of bruise" consists of a bruise not more than 1/2 square inch and not more than 1 1/2 square inches in area; each bruise larger than 1 1/2 square inches is considered as two instances of bruise. An "instance of black-belly lining or membrane" not less than 1/2 inch and not more than 1 inch in length; each additional 1/2 inch length of individual pieces of blood-spots or membrane longer than 1 inch is considered as one "instance of fin." One "instance of scales" is an aggregate area of scales greater than 1/2 square inch per filet. One "instance of skin" consists of one piece of skin at least 1/2 square inch in area; except that any skin patches larger than 1 1/2 square inches are considered as two instances of skin.

(4) **Bones.** One "instance of bones" means an objectionable bone or group of bones occupying or contacting a circular area up to 1 square inch. An objectionable bone is any bone of such size and rigidity as to remain objectionable after cooking. Bones which will soften or disintegrate after cooking are not considered objectionable.

(b) For the purpose of rating the factor of absence of defects the schedule of deduction-points in Table III applies.

**§ 269.17 Character.**

(a) General: The factor of character refers to the tenderness and moistness of the cooked fish flesh.

(b) For the purpose of rating the factor of character, the schedule of deduction-points in Table IV apply. Ocean-perch filets which receive 13 deduction-points for the factor of character shall not be graded above Substandard regardless of the total score for the product. This is a limiting rule.

TABLE III—SCORES DEDUCTIONS FOR ABSENCE OF DEFECTS

Subfactor	Method of determining subfactor score	Deduction points
Improper packing	Slit defects, not so noticeably affecting the product's appearance as to be objectionable	0
	Moderate defects, noticeably affecting the product's appearance	2
	Excessive defects, seriously affecting product's appearance	6
	Number of blemishes per 1 lb. of product when there are 0	0
	Over 0 not over 2	0
	Over 2 not over 4	2
	Over 4 not over 6	4
	Over 6 not over 8	6
	Over 8 not over 10	10
	Over 10 not over 15	15
Blemishes	Number of blemishes per 1 lb. of product when there are 0	0
	Over 0 not over 2	0
	Over 2 not over 4	2
	Over 4 not over 6	4
	Over 6 not over 8	6
	Over 8 not over 10	8
	Over 10 not over 15	10
	Over 15 not over 20	15
	Over 20 not over 30	20
	Over 30 not over 40	30
Bones	Number of instances per 1 lb. of product when there are 0 or less filets per lb.	0
	Over 0 not over 2	0
	Over 2 not over 4	2
	Over 4 not over 6	4
	Over 6 not over 8	6
	Over 8 not over 10	8
	Over 10 not over 15	10
	Over 15 not over 20	15
	Over 20 not over 30	20
	Over 30 not over 40	30
Cutting and trimming	Number of instances per 1 lb. of product when there are 0 or less filets per lb.	0
	Over 0 not over 2	0
	Over 2 not over 4	2
	Over 4 not over 6	4
	Over 6 not over 8	6
	Over 8 not over 10	8
	Over 10 not over 15	10
	Over 15 not over 20	15
	Over 20 not over 30	20
	Over 30 not over 40	30
Absence of defects	Number of instances per 1 lb. of product when there are 0 or less filets per lb.	0
	Over 0 not over 2	0
	Over 2 not over 4	2
	Over 4 not over 6	4
	Over 6 not over 8	6
	Over 8 not over 10	8
	Over 10 not over 15	10
	Over 15 not over 20	15
	Over 20 not over 30	20
	Over 30 not over 40	30

is maintained. Immerse the pouch and its contents in boiling water and cook until the internal temperature of the filets reaches 160° F. (about 20 minutes).

TABLE IV—SCORE DEDUCTIONS FOR CHARACTER

Texture of the cooked fish	Point deduction										
	0	1	2	3	4	5	6	7	8	9	10
1. Texture:											
(a) Firm, but tender and moist	0	0	0	0	0	0	0	0	0	0	0
(b) Slightly tough, dry, and/or fibrous, or too moist	0	0	0	0	0	0	0	0	0	0	0
(c) Moderately tough, rubbery, and/or flaccid	0	0	0	0	0	0	0	0	0	0	0
(d) Excessively tough, rubbery, and/or flaccid	0	0	0	0	0	0	0	0	0	0	0

**FOR CERTIFICATION TOLERANCES**

**§ 269.25 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. 6064, July 3, 1958).

**SCORE SHEET**

**§ 269.31 Score sheet for frozen ocean-perch filets.**

Label	.....
Net and gross weights	.....
Container mark or identification	.....
Number of packages per master carton	.....
Number of filets per package	.....
Type of overwrap	.....
Actual net weight	(b) .....

Factor	Score points	Sample score
Appearance.....	15	.....
Size.....	20	.....
Absence of defects.....	30	.....
Character.....	15	.....
Total.....	100	.....

Flavor and odor.....  
Final grade.....

Dated: December 17, 1960.

**ELMER P. BENNETT,**

*Acting Secretary of the Interior*

Note: Also see *Commercial Fisheries Review*, March 1960 p. 12 and December 1960 p. 94.

Correction: In the December 1960 issue of *Commercial Fisheries Review*, p. 95, under the title "Frozen Ocean Perch and Pacific Ocean Perch Fillets Voluntary Grade Standards" the scientific name of Pacific ocean perch should have read; "*Sebastes alutus*."



## Eighty-Seventh Congress

### (First Session)

**CONGRESS CONVENES:** The first session of the 87th Congress convened January 3, 1961.

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.



**BUY AMERICAN ACT:** H.R. 2073 (Stratton), introduced in House, January 4, a bill to amend title III of the act of March 3, 1933, commonly referred to as the Buy American Act, with respect to determining when the cost of certain articles, materials, or supplies is unreasonable, and for other purposes; to the Committee on Public Works. Would amend Buy American Act to make two important changes. First, would spell out in the statute the cost differential which Government agencies must be guided by in conforming with the requirement that they make their purchases from American manufacturers so long as the price differential is not unreasonable. At the present time the definition of reasonable and unreasonable price differentials is set by executive action. Until recently that figure has been set at 6 percent generally and 12 percent in the case of American-made goods manufactured in areas of substantial unemployment. The second feature of this bill is that it would establish the percentage at 25 percent.

**CATCH TRANSFER AT SEA:** H. R. 682 (Kilgore), January 3, 1961, introduced in House, a bill relating to documentation and inspection of vessels of the United States. The purpose of this bill is to legalize transferring of the catch of one fishing vessel to another on the

high seas, and transporting it without charge, to a port of the United States.

**COLUMBIA RIVER BASIN TREATY:** On January 17, the President submitted to the Senate a treaty (Executive C, 87th Congress, 1st Session), between the United States and Canada concerning the cooperative development of the water resources of the Columbia River Basin, signed at Washington, January 17, 1961, together with a report from the Secretary of State. The treaty envisages construction of reservoirs in Canada and the United States, which will in no way interfere with the cycle for salmon and other anadromous fish which constitute such an important economic and recreational asset for the people of the Pacific Northwest; referred to the Committee on Foreign Relations.

**CONSERVATION OF GAME AND FOOD FISH IN DAM RESERVOIRS:** S. 460 (Fulbright), introduced in Senate, January 17, a bill to direct the Secretary of the Interior to establish a research program in order to determine means of improving the conservation of game and food fish in dam reservoirs; to the Committee on Interstate and Foreign Commerce. Identical to H. R. 2722 (Clem Miller), introduced in House, January 16. Also H. R. 3072 (Reifel), introduced in House, January 23, similar to S. 460 except it is restricted to game fish only.

**CONSERVATION OF NATURAL RESOURCES:** S. 239 (Engle and 30 other Senators), introduced in Senate, January 9, a bill to declare a national policy on conservation, development, and utilization of natural resources, and for other purposes; to the Committee on Interior and Insular Affairs. Offers a declaration of national policy on resources conservation and utilization, and proposes to establish effective coordinating mechanism in the Executive Office of the President in the form of a permanent Council of Resources and Conservation Advisers.

**DEPRESSED AREAS:** H. R. 5 (Flood), introduced in House, January 3, a bill to establish an effective program to alleviate conditions of substantial and persistent unemployment and underemployment in certain economically depressed areas; to the Committee on Banking and Currency. Identical or similar to: Introduced in House: January 3: H. R. 34 (Walter), H. R. 76 (Conte), H. R. 273 (VanZandt), H. R. 361 (Gray), H. R. 420 (Mrs. Kee), H. R. 446 (Lesinski), H. R. 493 (Machrowicz), H. R. 499 (Morgan), H. R. 782 (Saylor), H. R. 807 (Multer), H. R. 1084 (Saylor), H. R. 1087 (Stratton), H. R. 1270 (Zelenko), H. R. 1724 (Blatnik), H. R. 1744 (Celler); January 4: H. R. 1759 (Curtin), H. R. 1931 (Ichord of Missouri), H. R. 1987 (Bailey), H. R. 1994 (Buckley), H. R. 2014 (Green of Pa.); January 9: H. R. 2247 (Holland), H. R. 2265 (Moeller), H. R. 2272 (Olson), H. R. 2288 (Schneebeil), H. R. 2330 (Whalley); January 12: H. R. 2472 (Dingell), H. R. 2486 (Kowalski), H. R. 2495 (McDowell), H. R. 2510 and H. R. 2511 (Rabaut), H. R. 2528 (Slack), H. R. 2547 (Monagan), H. R. 2550 (Morris); January 16: H. R. 2738 (Shipley), H. R. 2947 (Scranton), H. R. 2702 (Friedel), H. R. 2717 (Lane), H. R. 2725 (Geo. P. Miller); January 18: H. R. 2860 (Addonizio), H. R. 2861 (Garmatz), H. R. 2862 (Granahan), H. R. 2863 (Natcher), H. R. 2864 (O'Konski), H. R. 2865 (Sheppard), H. R. 2866 (Rhodes of Pa.); January 23: H. R. 3016 (Barrett), H. R. 3053 (Clem Miller), H. R. 3070 (Nix), H. R. 3072 (Reifel); January 25: H. R. 3262 (Dent), H. R. 3268 (Farbstein), H. R. 3225 (Multer), H. R. 3337 (Price); January 26: H. R. 3430 (Brademas). Introduced in Senate January 5: S. 1 (Douglas, et al), S. 6 (Scott), and S. 9 (Dirksen, et al).

**DEVELOPMENT LOAN FUND:** H.R. 2072 (Stratton), introduced in House, January 4, a bill to amend section 202(b) of the Mutual Security Act of 1954 so as to require that dollar funds made available to foreign countries by the Development Loan Fund for the purchase of materials or supplies shall be utilized for the purchase of materials or supplies produced in areas of substantial and persistent unemployment in the United States; to the Committee on Foreign Affairs. Would direct the Development Loan Fund, in making purchases from American manufacturers, to give priority consideration to manufacturers located in areas of substantial unemployment.

**EXEMPT RAILROAD TRANSPORTATION FOR FISH, LIVESTOCK, AND AGRICULTURAL COMMODITIES:**

H.R. 1823 (Rostenkowski), introduced in House, January 4, 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. Would extend to the railroads an exemption from economic regulation in the transporting of various commodities, among which is included cooked or uncooked (including breaded) fish or shellfish when frozen or fresh, but not including fish and shellfish which have been treated for preserving, such as canned, smoked, pickled, spiced, corned or kippered products.

**FISHERMEN'S COOPERATIVES ASSOCIATION**

**BANK:** H.R. 717 (Lane), introduced in House, January 3, a bill to provide credit facilities for the use of fishermen's cooperative associations through establishment of a Bank for Fishermen's Cooperative Associations, and for other purposes; to the Committee on Merchant Marine and Fisheries.

**FISHERY CONSERVATION MEASURES:** S. 18

(Bennett), introduced in Senate, January 5, a bill to provide fishery conservation measures on the Provo River, Utah, and for other purposes; referred to the Committee on Interstate and Foreign Commerce.

**FISHERY LOAN FUND AMENDMENTS:** H.R. 206

(Bonner), introduced in House, January 3, a bill to facilitate administration of fishery loan fund established by section 4 of the Fish and Wildlife Act of 1956, and for other purposes; to the Committee on Merchant Marine and Fisheries. Would give Secretary of the Interior authority to dispose of property acquired through foreclosure of vessel mortgages under the Fisheries Loan Fund.

**FOOD ADDITIVES:** Submitted to the House, January 16, **Ex. Communication 298**, a letter from the Secretary, Department of Health, Education, and Welfare, transmitting a draft of proposed legislation entitled "A bill to amend the transitional provisions of the act approved September 6, 1958, entitled 'An act to protect the public health by amending the Federal Food, Drug, and Cosmetic Act to prohibit the use in food of additives which have not been adequately tested to establish their safety, and for other purposes;'" to the Committee on Interstate and Foreign Commerce. Also the same letter submitted to the Senate, January 26; to the Committee on Labor and Public Welfare.

**FOOD ALLOTMENT PROGRAM:** S. 23 (Aiken, for himself, Young of North Dakota, Humphrey and Anderson), introduced in Senate, January 5, a bill to safeguard the health, efficiency, and morale of the American people to provide for improved nutrition through a more effective distribution of food supplies through a food-allotment program; to assist in maintaining fair prices and incomes to farmers by providing adequate outlets for agricultural products; to prevent burdening and obstructing channels of interstate commerce; to promote the full use of agricultural resources, and for other purposes; to Committee on Agriculture and Forestry. The term "basic food allotment" shall mean the following amounts of food per person per week or the equivalent thereof in nutritional value as determined by the Secretary of Agriculture, meat, poultry, and fish, one pound twelve ounces.

**FOOD STAMP PLAN:** H.R. 892 (Anfuso), introduced in House, January 3, a bill to provide for the establishment of a food stamp plan for the distribution of \$1,000,000,000 worth of surplus food commodities a year to needy persons and families in the United States; to the Committee on Agriculture. Would authorize and direct the Secretary of Agriculture to operate a program to distribute to needy persons in the United States through a food stamp system such surplus food commodities.

**FOREIGN-FLAG VESSELS LANDING FISH IN VIRGIN ISLANDS:** **Ex. Communication 274**, a letter from the Assistant Secretary of the Interior, transmitting a draft of proposed legislation entitled "A bill to permit certain foreign-flag vessels to land their catches of fish in the Virgin Islands in certain circumstances, and for other purposes"; referred to the House Committee on Merchant Marine and Fisheries on January 12. The same letter received in Senate on January 17, and referred to Committee on Interstate and Foreign Commerce.

H.R. 3159 (Bonner), introduced in House, January 24, a bill to permit certain foreign-flag vessels to land their catches of fish in the Virgin Islands in certain circumstances, and for other purposes; to the Committee on Merchant Marine and Fisheries. Would permit foreign-flag vessels of not more than 50 feet over-all length to land catches, which range from about 900 to 4,000 pounds, in ports of Virgin Islands. Bureau of Customs has been overlooking this small importation of fresh fish in small boats from nearby places since the supply was for immediate local consumption in the Islands. The Collector of Customs, U.S. Treasury Department, was approached by certain large fishing and packing interests, inquiring as to the possibility of their landing fresh tuna in the Virgin Islands taken by Japanese fishing vessels, canning the catch in canneries to be established in the Virgin Islands, and thereafter shipping the product to ports or places in the continental United States without payment of duty. This legislation will permit catches of the small boats to be landed in the Virgin Islands as long as the landings are for immediate consumption. Sale of the imported fresh fish to any agent, representative, or employees of a freezer or cannery is prohibited in the absence of satisfactory evidence that such sale or transfer is for immediate consumption. Identical to S. 679 (Magnuson), introduced in Senate, January 30.

**FOREIGN TRADE STUDY COMMISSION:** S.J. Res. 25 (Dirksen), introduced in Senate, January 9, a 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; to the Committee on Interstate Commerce.

**HARBOR FACILITIES REHABILITATION:** H. R. 348 (Fallon), introduced in House, January 3, a bill to establish within the Housing and Home Finance Agency a new program of mortgage insurance to assist in financing the construction, improvement, expansion, and rehabilitation of harbor facilities for boating and commercial craft; to the Committee on Banking and Currency.

**IMPORT COMPETITION ADJUSTMENT:** H. R. 757 (Mrs. St. George), introduced in House, January 3, a bill to provide for adjusting conditions of competition between certain domestic industries and foreign industries with respect to the level of wages and the working conditions in the production of articles imported into the United States; to the Committee on Ways and Means.

**IMPORTED COMMODITY LABELING:** H. R. 2484 (Herlong), introduced in House, January 12, a bill to amend the Tariff Act of 1930 with respect to the marking of imported articles and containers; to the Committee on Ways and Means.

**IMPORTS OF POLLUTED SHELLFISH PROHIBITED:** H. R. 659 (Colmer), introduced in the House, January 3, a bill to prohibit the importation into the United States of polluted shellfish; to the Committee on Ways and Means. Would ascertain that sanitary standards governing the harvesting and preparation of shellfish for importation into United States are not lower than the minimum standards prescribed by Public Health Service, under its program of supervision of like products in interstate commerce.

**MARINE MAMMAL HIGH SEAS PROTECTION:** H. R. 777 (Saylor), introduced in House, January 3, a bill for the protection of marine mammals on the high seas, and for other purposes; to the Committee on Merchant Marine and Fisheries. Would give Secretary of Interior authority to take proper action to protect, conserve, and manage species of polar bear, sea otter, and walrus.

**MAXIMUM WORKWEEK REDUCTION:** H. R. 248 (Libonati), introduced in House, January 3, a bill to reduce the maximum workweek under the Fair Labor Standards Act of 1938, as amended to 35 hours, and for other purposes; to the Committee on Education and Labor. Under this legislation the maximum workweek for which an employee may be employed under section 7 of the Fair Labor Standards Act of 1938, as amended, without compensation for his employment at a rate not less than one and one-half times the regular rate at which he is employed shall not (1) after the expiration of two years from the effective date of this Act exceed thirty-seven and one-half hours; nor (2) after the expiration of four years from the effective date of this Act exceed thirty-five hours. Every employer who employs any of his employees in excess of the hours specified shall pay such employee compensation for his employment in excess of such hours at a rate not less than one and one-half times the regular rate at which he is employed. Also H. R. 1940 (Holland), introduced January 6.

**MEDICAL CARE FOR FISHING VESSEL OWNERS:** H. R. 2252 (Clem Miller), introduced in House, January 9, a bill to amend section 322 of the Public Health Service Act to permit certain owners of fishing boats to receive medical care and hospitalization without charge at hospitals of the Public Health Service; to the Committee on Interstate and Foreign Commerce.

**MEDICAL CARE FOR VESSEL PERSONNEL:** S. 367 (Magnuson and Bartlett), introduced in Senate, January 11, a bill to provide medical care for certain persons engaged on board a vessel in the care, preservation, or navigation of such vessel; to the Committee on Interstate and Foreign Commerce.

**METRIC SYSTEM STUDY:** H. R. 269 (Roosevelt), introduced in House, January 3, a bill to provide that the Secretary of Commerce shall conduct a study to determine the practicability and desirability of the adoption by the United States of the metric system of weights and measures; to the Committee on Science and Astronautics. Also H. Con. Res. 44 (Fulton), and H. R. 2049 (Geo. P. Miller), introduced in House, January 6.

**MINIMUM WAGE LEGISLATION:** H. R. 13 (Rooney), introduced in House, January 3, a bill to amend the Fair Labor Standards Act of 1938 so as to increase from \$1 to \$1.25 the minimum hourly wage prescribed by section 6 (a) (1) of that act; to the Committee on Education and Labor. Similar or identical to following bills also introduced January 3: H. R. 208 (Buckley), H. R. 240 (Libonati), H. R. 440 (Lesinski), H. R. 671 (Gilbert), H. R. 716 (Lane), H. R. 882 (Multer), H. R. 1263 (Zelenko); January 4: H. R. 1726 (Ashley), H. R. 1749 (Celler), H. R. 2067 (Shelley), H. R. 2412 (Dingell). Introduced in Senate January 9: S. 256 (Dirksen).

Submitted to House, January 21, Executive Communication 431, a letter from the Secretary of Labor, transmitting a report of information pertaining to extension of the act's protection to additional employees, and summarizes data concerning the minimum wage, pursuant to section 4(d) of the Fair Labor Standards Act; to the Committee on Education and Labor.

**NATIONAL AQUARIUM IN DISTRICT OF COLUMBIA:** H. R. 111 (Kirwin), introduced in House, January 3, a bill to authorize the Secretary of the Interior to construct a National aquarium in the District of Columbia; to the Committee on the District of Columbia.

**NATIONAL FISHERIES CENTER IN DISTRICT OF COLUMBIA:** H. R. 2720 (McMillan), introduced in House, January 16, a bill to create a Federal planning commission to conduct a study of the possible establishment in the District of Columbia of a National fisheries center; to the Committee on the District of Columbia.

**NATIONAL SCIENCE ACADEMY:** H. R. 1 (Anfuso), introduced in House, January 3, a bill to provide for the establishment, under the National Science Foundation, of a National Science Academy; to the Committee on Science and Astronautics, similar to H. R. 266 (Pucinski), introduced in House January 3.

**OUTDOOR RECREATIONAL RESOURCES:** H. R. 904 (Bennett of Fla.), introduced in House, January 3, a bill to provide for the establishment on an effective Federal aid program to assist States in the development of certain outdoor recreational resources; to Committee on Interior and Insular Affairs.

H. R. 2204 (Aspinall), introduced in House, January 9, a bill to extend the time in which the Outdoor Recreation Resources Review Commission shall submit its final report; to the Committee on Interior and Insular Affairs. Also S. 449 (Anderson), introduced in Senate, January 17.



**OYSTER PLANTERS DISASTER LOANS:** H. R. 946 (Downing), introduced in House, January 3, a bill to extend to oyster planters the benefits of the provisions of the present law which provide for production disaster loans for farmers and stockmen; to the Committee on Agriculture.

**POWER PROJECTS FISHERY RESOURCES PROTECTION:** H. R. 1764 (Dingell), introduced in House, January 3, 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; to the Committee on Interstate and Foreign Commerce.

S. 323 (Church, Neuberger, and Engle), introduced in Senate, January 10, a bill to provide for the conservation of anadromous fish spawning areas in the Salmon River, Idaho; to the Committee on Interstate and Foreign Commerce. Purpose is to prohibit, until developments justify a change in this policy, the authorization of structures on the Salmon River that would restrict the passage of such fish to reach spawning areas or which would flood established spawning grounds. Also H. R. 3589 (Westland), introduced in House January 30.

**SALTONSTALL-KENNEDY ACT FUND REAPPORTIONMENTS:** H. R. 615 (Antuso), introduced in House, January 3, a bill to amend the act of August 11, 1939, with respect to the allocations of funds available under that act, and for other purposes; to the Committee on Merchant Marine and Fisheries. Also H. R. 2255 (Lennon), introduced in House on January 9.

**SCIENCE DEPARTMENT:** S. 623 (Kefauver), on January 26, introduced in Senate a bill to establish a U.S. Department of Science and to prescribe the functions thereof; to the Senate Committee on Government Operations. Would achieve over-all coordination in matters pertaining to science, through establishment of a new Federal department, so that the nation can forge ahead in scientific technology and research.

**SENATE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE INVESTIGATIONS:** S. Res. 74 (Magnuson), on January 26, the Senate Committee on Interstate and Foreign Commerce reported an original resolution authorizing the Committee to investigate certain matters within its jurisdiction; to the Senate Committee on Rules and Administration. Empowers Committee to examine, investigate, and make complete study of any and all matters pertaining to, among others, fisheries and wildlife, and marine sciences. The Senate Committee on Interstate and Foreign Commerce shall report its findings together with recommendations for legislation as it deems advisable at earliest practicable date, but not later than January 31, 1962. Expenses of said committee shall not exceed \$315,000. Continues its four standing subcommittees, including the one on Merchant Marine and Fisheries.

**SHELLFISHERIES RESEARCH CENTER:** S. 606 (Bush, for himself and Dodd), introduced in Senate, January 26, a bill to provide for the construction of a shellfisheries research center at Milford Conn.; to the Senate Committee on Interstate and Foreign Commerce. Would provide funds for construction of a research center consisting of pilot hatchery including rearing tanks and ponds, and a training school, which shall be used for the conduct of basic research on the physiolo-

gy and ecology of commercial shellfish, the development of hatchery methods for cultivation of mollusks, including the development of principles that can be applied to water ponds for shellfish culture, and to train persons in the most advanced methods of shellfish culture. The State of Connecticut has donated to the Federal Government land for the new building, and this bill would authorize an appropriation of \$1,250,000 for the Research Center, and \$75,000 for hatchery ponds. Identical to H. R. 2894 (Gaimo).

**SHRIMP IMPORT DUTIES:** H. R. 573 (Thompson), introduced in House, January 3, a bill to amend the Tariff Act of 1930 to provide for the establishment of country-by-country quotas for the importation of shrimp and shrimp products, to impose a duty on all unprocessed shrimp imported in excess of the applicable quota, and to impose a duty on processed shrimp and prohibit its importation in excess of the applicable quota; to the Committee on Ways and Means. Similar to H. R. 653 (Colmer), and H. R. 1810 (Lennon), introduced also January 3.

H. R. 659 (Colmer), a bill introduced in the House on January 3, 1961, to provide for an ad valorem duty on the importation of shrimp; to the Committee on Ways and Means.

**SUBMERGED LANDS ACT AMENDMENT:** H. R. 4 (Boykin), introduced in House on January 3, 1961, a bill to amend the Submerged Lands Act to establish the seaward boundaries of the States of Alabama, Mississippi, and Louisiana as extending 3 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; to the Committee on the Judiciary. Similar to H. R. 22 (Roberts), introduced in House January 3; H. R. 2574 (Selden), introduced in House January 12; S. 406 (Hill, et al), introduced in Senate January 13.

**TARIFF NEGOTIATIONS:** H. Con. Res. 4 (Bailey), introduced in House, January 3, a concurrent resolution declaring the sense of the Congress that no further reduction in tariffs be made during the life of the present Reciprocal Trade Agreements Act; to the Committee on Ways and Means. This resolution expresses the sense of Congress that the President should not exercise the authority granted him in the Trade Extension Act of 1958 to reduce existing tariffs by as much as 20 percent. Similar or identical to resolutions also introduced on January 3: H. Con. Res. 10 (Flynt); January 6: H. Con. Res. 42 (James C. Davis), H. Con. Res. 50 (Utt); January 9: H. Con. Res. 54 (Lane), H. Con. Res. 57 (Van Zandt); January 12: H. Con. Res. 72 (Berry), H. Con. Res. 74 (Cederburg), H. Con. Res. 75 (Dorn), H. Con. Res. 76 (Mason), H. Con. Res. 77 (Whitener); January 16: H. Con. Res. 85 (Cunningham), H. Con. Res. 86 (Dent), H. Con. Res. 87 (Fisher), H. Con. Res. 88 (Kitchin); January 18: H. Con. Res. 92 (Alexander), H. Con. Res. 98 (McIntire), H. Con. Res. 100 (Riley), H. Con. Res. 101 (Slack); January 23: H. Con. Res. 106 (Scherer), H. Con. Res. 108 (Staggers); H. Con. Res. 110 (Barling), H. Con. Res. 111 (Hiestand); January 25: H. Con. Res. 118 (Stratton); January 26: H. Con. Res. 122 (Moeller), January 30: H. Con. Res. 124 (Clark). Introduced in Senate: January 17: S. Res. 46 (Stallstall).

**TARIFF REVISIONS:** H. R. 3095 (Staggers), introduced in House, January 23, a bill to amend the Tariff

Act of 1930, and for other purposes; to Committee on Ways and Means. Would amend the Tariff Act of 1930 with respect to import classifications and rates, administration of trade agreements, periodic adjustment of import duties, statistical enumeration, and exclusion of articles from entry. Identical to H.R. 17 (Bailey).

**TARIFF STUDY COMMISSION:** H. J. Res. 65 (Robison), introduced in House, January 3, a 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; to Committee on Ways and Means. Would create a commission consisting of twelve members, chosen from general public--industry, labor, agriculture, trade, and Government--which would study, among others, impact of foreign trade in goods and services upon American economy; differentials in labor, etc., between foreign and domestic producers; prices of major goods and services in United States and abroad; aid rendered by United States and foreign governments to export trade, etc. Similar to S. J. Res. 25 (Dirksen, et al), introduced in Senate, January 9; identical to H. J. Res. 152 (Riehlman), introduced in House, January 3.

**WATER POLLUTION CONTROL:** Executive Communication submitted to Senate on January 26, a letter from the Assistant Secretary of Health, Education, and Welfare, transmitting a draft of proposed legislation 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 (with accompanying papers); to the Senate Committee on Public Works.

**WATER POLLUTION CONTROL RESEARCH LABORATORY:** S. 325 (Morse, Neuberger, and Magnuson),

introduced in Senate on January 10, a bill to establish a Federal Regional Water Pollution Control Research Laboratory in the Pacific Northwest and for other purposes; to the Committee on Public Works. The Surgeon General of the United States is directed to establish a laboratory for research into the pollution control problems of the Northwestern United States. Problems shall include, but not be limited to, municipal and industrial water supply, municipal and industrial pollution, fish, aquatic life and wildlife, forestry and wood products, reservoirs and effects of storage on water quality and recreational facilities. Also H.R. 2054 (Norblad) introduced in House, January 6.

**WATER RESOURCES:** S. 498 (Bartlett & Gruening), on January 17, 1961, introduced a bill to establish a water resources commission for Alaska; to the Committee on Interior and Insular Affairs. The commission, to be created by this bill, would be the principal agency for coordinating Federal, States, and local plans for developing water and related land resources in Alaska.

Executive Communication submitted to Senate on January 26, a letter from the Director, Bureau of the Budget, Executive Office of the President, transmitting a draft of proposed legislation to redefine the authority of the Secretary of the Interior and others for the purpose of providing for coordinated planning for the development of the Nation's water and related land resources through the establishment of water resources commissions (with an accompanying paper); to the Senate Committee on Interior and Insular Affairs.

**WEATHER STATION IN GULF:** H.R. 651 (Colmer), introduced in House, January 3, a bill to provide that one floating ocean station shall be maintained at all times in the Gulf of Mexico to provide storm warnings for States bordering on the Gulf of Mexico; to the Committee on Merchant Marine and Fisheries.



### NEW METHOD OF CURING SALT COD

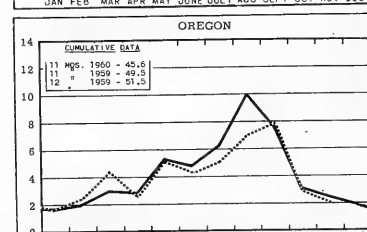
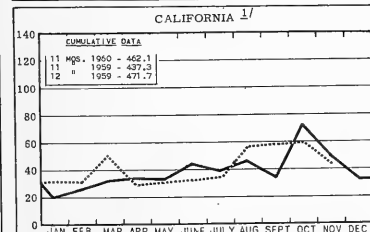
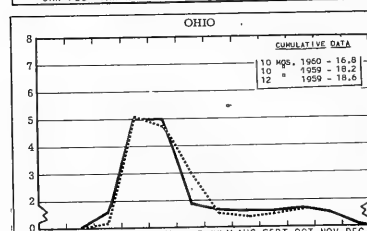
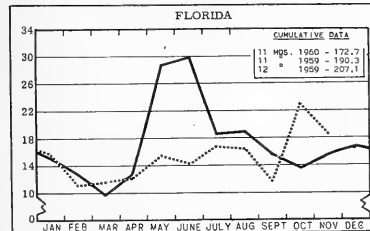
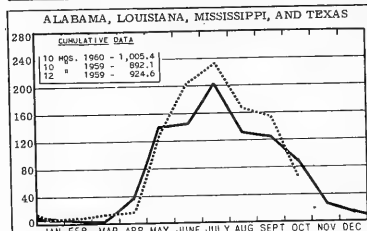
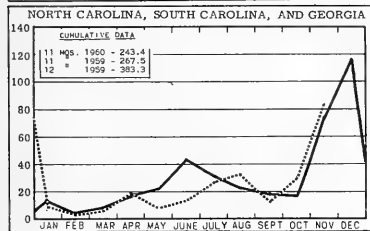
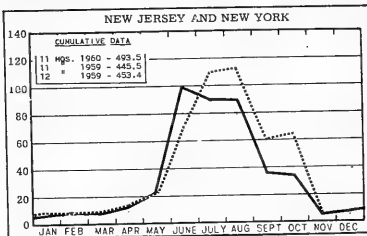
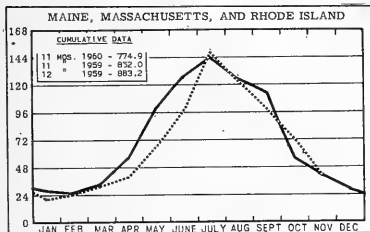
A new method of curing salt cod, known as the "mechanical flake," is in operation at a Newfoundland, Canada, plant. Instead of the conventional drying racks made of "longers and boughs," the new process requires well-built and sturdy wooden racks. These are made to fit wire trays on which the fish are spread. The trays are pulled into position and removed by means of a cable and winch. This method of spreading the fish enables a crew of 14 men to handle 500,000 pounds in less than 1 hour. The same number of men spreading fish by hand would take many more hours to handle the same quantity.

--Canadian Fisherman, November 1953

# FISHERY INDICATORS

## CHART I - FISHERY LANDINGS for SELECTED STATES

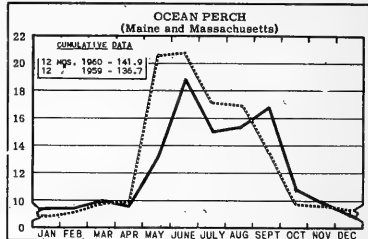
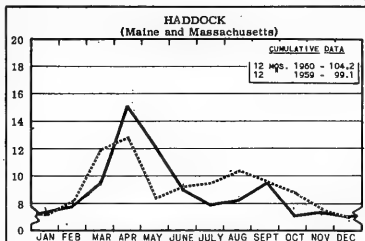
In Millions of Pounds



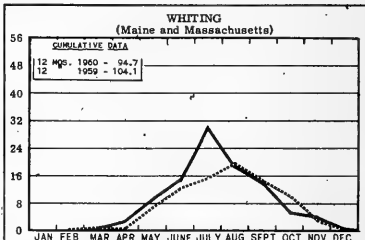
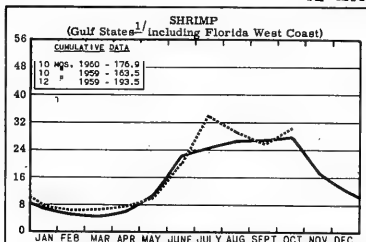
1/ONLY PARTIAL--INCLUDING PRODUCTION OF MAJOR FISHERIES AND MARKET FISH LANDINGS AT PRINCIPAL PORTS.

## CHART 2 - LANDINGS for SELECTED FISHERIES

In Millions of Pounds

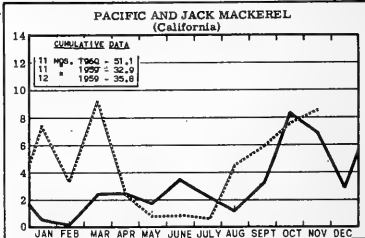
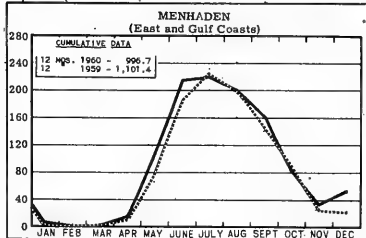


In Millions of Pounds

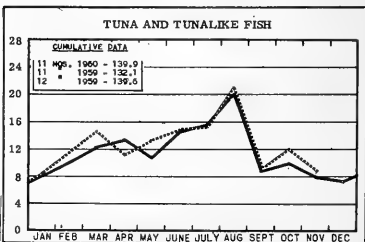
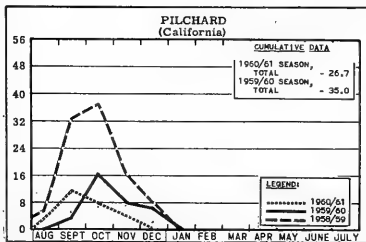


<sup>1/2</sup>LA. & ALA. DATA BASED ON LANDINGS AT PRINCIPAL PORTS AND ARE NOT COMPLETE.

In Thousands of Tons

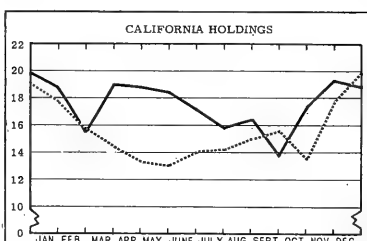
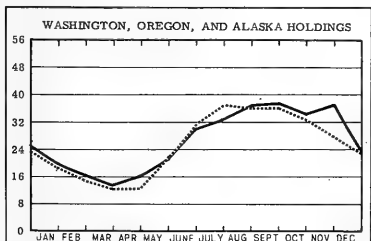
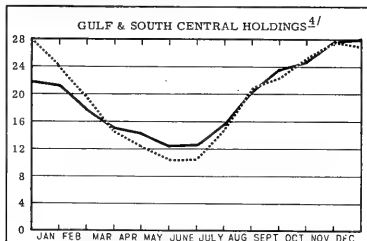
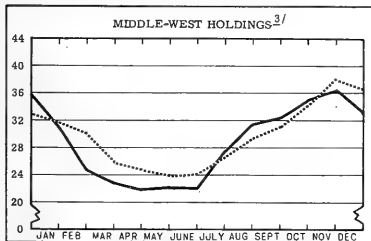
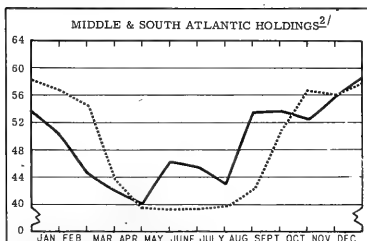
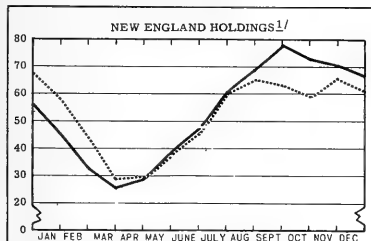
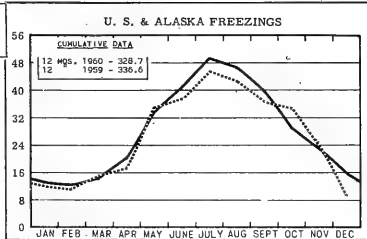
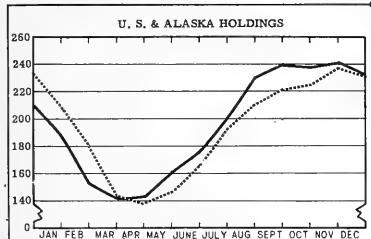


In Thousands of Tons



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

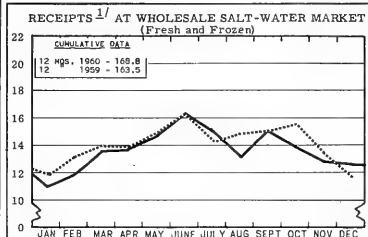
In Millions of Pounds



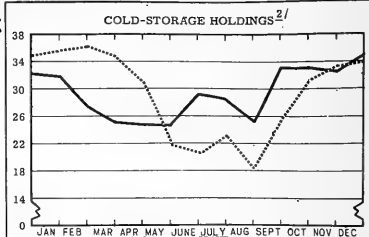
\* Excludes salted, cured, and smoked products.

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

In Millions of Pounds

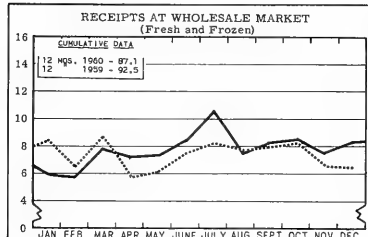


**NEW YORK CITY**

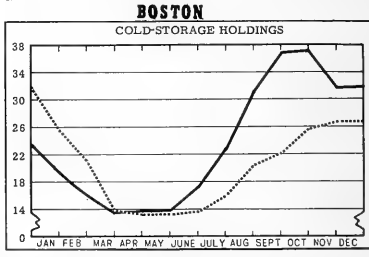
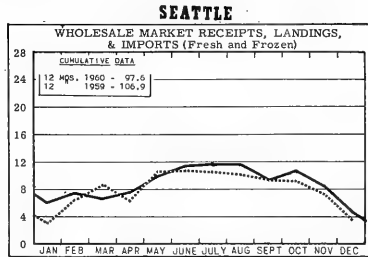
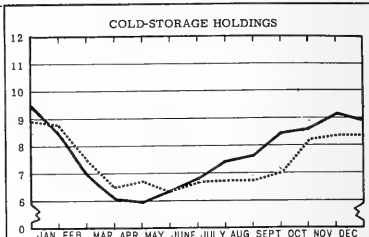


<sup>1/</sup>INCLUDE TRUCK AND RAIL IMPORTS FROM CANADA AND DIRECT VESSEL LANDINGS AT NEW YORK CITY.

<sup>2/</sup>AS REPORTED BY PLANTS IN METROPOLITAN AREA.

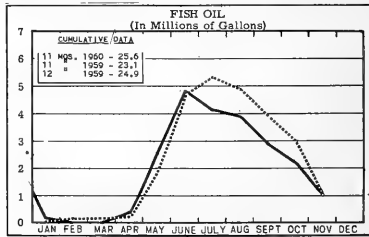
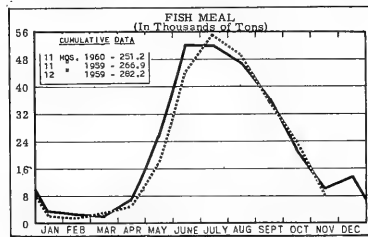


**CHICAGO**



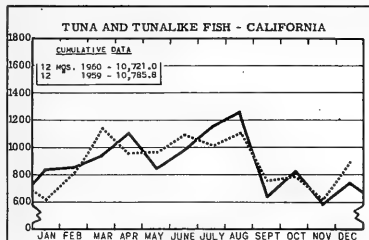
LEGEND:  
 \*\*\*\*\* 1950  
 ————— 1959

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

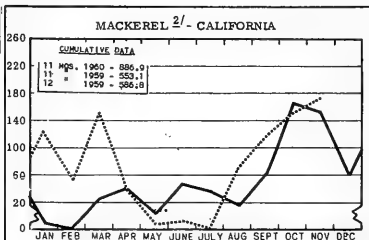


# CHART 6 - CANNED PACKS of SELECTED FISHERY PRODUCTS

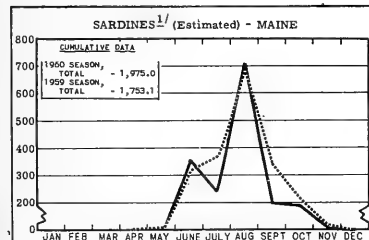
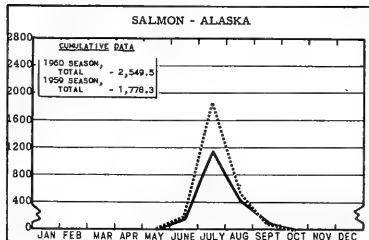
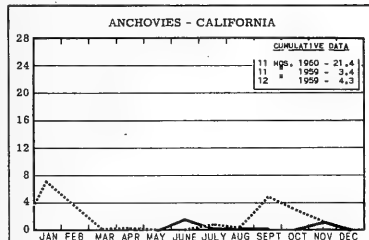
In Thousands of Standard Cases



LEGEND:  
 ..... 1960  
 ——— 1959



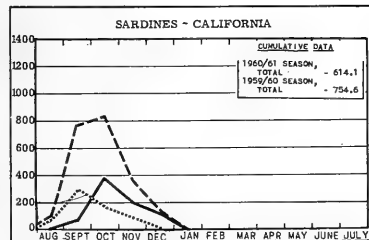
2/ INCLUDES PACIFIC MACKEREL AND JACK MACKEREL.



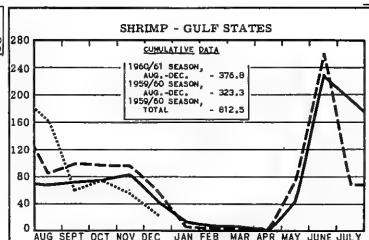
1/ INCLUDING SEA HERRING.

**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.

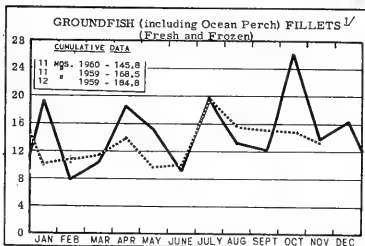


LEGEND:  
 ..... 1960/61  
 - - - - 1959/60  
 ——— 1958/59

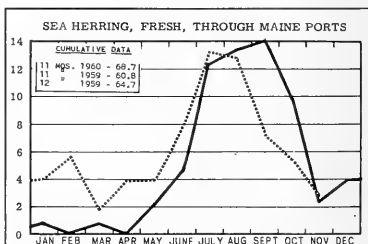
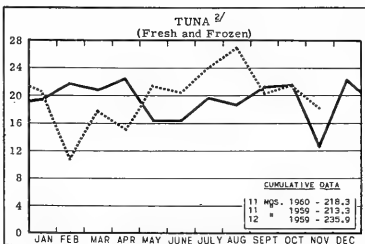
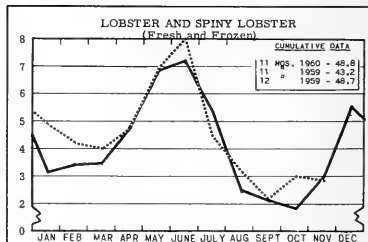
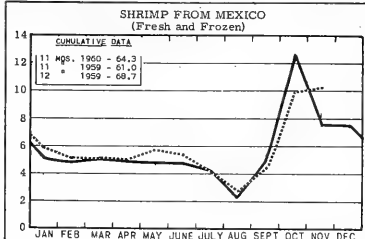
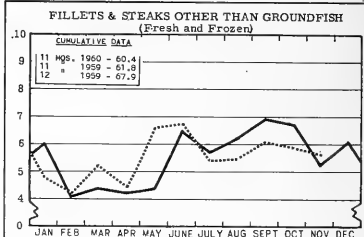


# CHART 7 - U.S. FISHERY PRODUCTS IMPORTS

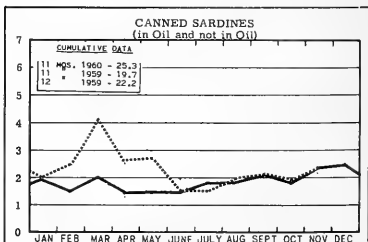
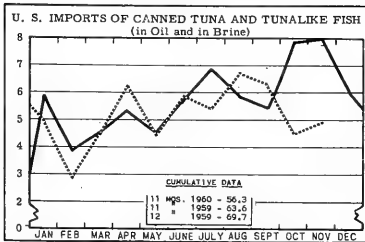
In Millions of Pounds



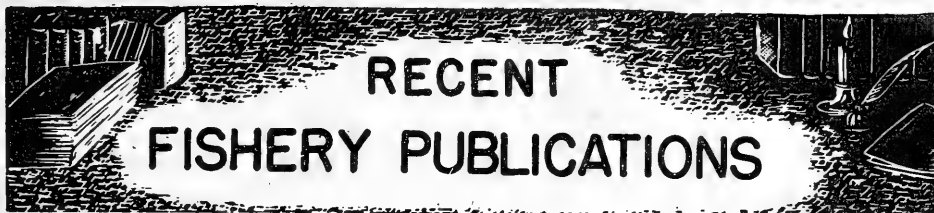
LEGEND:  
 ..... 1959  
 ——— 1960



<sup>2/</sup> EXCLUDES LOINS AND DISCS.







# 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-2339 | - Alaska Fisheries, 1959 Annual Summary (Revised), 8 pp.                                     |
| CFS-2369 | - South Atlantic Fisheries, 1959 Annual Summary (Revised), 10 pp.                            |
| CFS-2411 | - (Supplement) - Foreign Trade in Fish and Marine-Animal Oils, 1925-1959 (H.S.No. 3), 10 pp. |
| CFS-2418 | - Massachusetts Landings, August 1960, 5 pp.   |
| CFS-2419 | - Fish Sticks and Portions, July-September 1960, 3 pp.                                       |
| CFS-2421 | - New Jersey Landings, September 1960, 3 pp.   |
| CFS-2422 | - North Carolina Landings, September 1960, 3 pp.   |
| CFS-2424 | - Alabama Landings, July 1960, 2 pp.   |
| CFS-2425 | - Florida Landings, September 1960, 7 pp.  |
| CFS-2426 | - Maine Landings, August 1960, 3 pp.   |
| CFS-2427 | - Frozen Fish Report, October 1960, 8 pp.  |
| CFS-2428 | - Shrimp Landings, August 1960, 6 pp.  |
| CFS-2431 | - South Carolina Landings, September 1960, 2 pp.   |
| CFS-2432 | - Alabama Landings, August 1960, 2 pp.   |
| CFS-2434 | - Maryland Landings, September 1960, 3 pp.   |
| CFS-2436 | - Ohio Landings, September 1960, 2 pp.   |
| CFS-2437 | - Virginia Landings, September 1960, 3 pp.   |
| CFS-2438 | - New York Landings, September 1960, 4 pp.   |
| CFS-2440 | - Rhode Island Landings, September 1960, 3 pp.   |
| CFS-2442 | - California Landings, July 1960, 4 pp.  |
| CFS-2443 | - North Carolina Landings, October 1960, 3 pp.   |
| CFS-2446 | - South Carolina Landings, October 1960, 2 pp.   |
| CFS-2447 | - Mississippi Landings, August 1960, 2 pp.   |
| CFS-2450 | - New Jersey Landings, October 1960, 3 pp.   |
| CFS-2452 | - Maine Landings, September 1960, 3 pp.  |
| CFS-2453 | - Georgia Landings, October 1960, 2 pp.  |
| CFS-2455 | - Florida Landings, October 1960, 7 pp.  |
| FL-254   | - (Revised October 1960) - List of Fishery Associations in the United States, 13 pp.         |
| FL-336tt | - Commercial Fisheries Outlook, October-December 1960, 44 pp.                                |

SL-26 - Wholesale Dealers in Fishery Products, Illinois (Great Lakes Area), 1960 (Revised).

SSR-Fish. No. 341 - Microhematocrit as a Tool in Fishery Research and Management, by S. F. Snieszko, 17 pp., illus., June 1960.

SSR-Fish. No. 344 - Observations on Fishes and Other Biota of East Lagoon, Galveston Island, by Edgar L. Arnold, Jr., Ray S. Wheeler, and Kenneth N. Baxter, 33 pp., illus., July 1960.

SSR-Fish. No. 347 - Survey of the Ocean Fisheries off Delaware Bay--Supplemental Report, 1954-57, by John W. Reintjes and Charles M. Rothmayr, 22 pp., illus., July 1960. This report concludes a survey of ocean fisheries off Delaware Bay for the period 1954-57 (includes some data on the 1958 winter fisheries) and constitutes a supplement to a report for the period 1946-53. Measurements of catch, catch per unit effort, and total fishing effort for the major fisheries of the area (excluding the menhaden purse-seine fishery) indicate that the otter-trawl and pot fisheries have remained relatively stable during the period. The surf-clam fishery has shown an increased production, but a decline in apparent abundance. Minor fisheries, including pound net, gill net, trawl line, hand line, and purse seine for food fish, have dwindled in importance, and some are near extinction. Recommendations are included concerning utilization of the fishery resources of the area and proposed studies, and waste disposal in the coastal waters.

SSR-Fish. No. 354 - The Abundance and Distribution of Hard Clams in Nantucket Sound, Massachusetts, 1958, by John W. Ropes and Charles E. Martin, 14 pp., illus., July 1960. A survey was made during the summer of 1958 to assess the abundance of hard clams, *Venus (Mercenaria) mercenaria*, in Nantucket Sound, Mass. A jet (hydraulic) dredge was used as the principal sampling gear. Data from 214 sample stations compared with other Atlantic Coast areas indicated that the abundance of hard clams in Nantucket Sound was extremely low. The survey revealed no new general areas of commercial abundance. No clams less than 60 millimeters (2-3/8 inches) were caught. Because of hydrographic conditions unfavorable for spawning and setting and because there are few clams to augment the present stocks, the future of this fishery is uncertain.

SSR-Fish. No. 356 - Size Distribution of Pink Shrimp, *PENAEUS DUORARUM*, and Fleet Concentrations on the Tortugas Fishing Grounds, by Edwin S. Iversen,

Andrew E. Jones, and C. P. Idyll, 65 pp., illus., August 1960. A study of the pink shrimp, *Penaeus duorarum*, on the Tortugas fishing grounds was undertaken during 1957 and 1958 to provide information on the nature of the relation between the size of shrimp and the depth of water where they occur, together with fleet concentrations and degree of discarding of small pink shrimp. The average carapace length of both male and female shrimp increased both with depth of water and with northerly distance from the Florida Keys. Small pink shrimp were most abundant from September 1957 through May 1958, appearing on the eastern and southeastern portion of the grounds, where the highest trawl catches were made. The fleet concentrated there during December to June but was more widely distributed during the summer. Apparently, few small pink shrimp were discarded.

SSR-Fish. No. 360 - Passamaquoddy Fisheries Investigations, 1957-1958 (Report to the International Joint Commission), by International Passamaquoddy Fisheries Board, 47 pp., illus., August 1960. In 1956, the Governments of Canada and the United States asked the International Joint Commission to determine whether the tidal forces of Passamaquoddy and Cobscook Bays could be used to produce hydroelectric power, and to appraise the effect of power dam construction on the important fish and shellfish industries of the area. The present report gives findings, conclusions, and recommendations of the Board set up to implement this request.

SSR-Fish. No. 362 - Main-Stem and Tributary Sampling of Red Salmon Scales for Population Studies, by Ted S. Y. Koo and Howard D. Smith, 12 pp., illus., August 1960.

Sep. No. 609 - Shrimp Exploration in Central Alaskan Waters by the M/V John N. Cobb, October-November 1959.

Sep. No. 610 - Physical and Chemical Properties of Shrimp Drip as Indices of Quality.

Sep. No. 611 - Equipment Note No. 8 - New Hydraulically-Driven Block.

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-13	- India's Fisheries, 1959, and Export Potentialities.
MNL-40	- Fisheries in Morocco, 1959.

THE FOLLOWING PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary - Fishery Products, August, September, October, and November 1960, 8 pp. each. (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,

October and November 1960; 16 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 and sardines; pack of canned tuna, mackerel, anchovies, and sardines; market fish receipts at San Pedro, Santa Monica, and Eureka areas; California and Arizona imports; canned fish and frozen shrimp prices; and ex-vessel prices for cannery fish; for the months indicated.

California Fishery Market News Monthly Summary, Part II--Fishing Information, October 1960; November 1960; 8 pp. each, illus. (Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego 6, Calif.) 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.

Chemical Control of Shellfish Enemies, by V. L. Loosanoff, C. L. MacKenzie, Jr., and H. C. Davis, Bulletin No. 8, 20 pp. processed. Biological Laboratory, Bureau of Commercial Fisheries, U. S. Fish and Wildlife Service, Milford, Conn., November 16, 1960. A report on chemical control of shellfish predators and competitors, which covers progress made in the use of heavy oils mixed with inert carriers as a control of clam and oyster enemies such as starfish and boring snails. Detailed data are presented on the results of the use of various types of oils as shown by semiweekly collections of oyster spat in Milford Harbor.

(Chicago) Monthly Summary of Chicago's Fresh and Frozen Fishery Products Receipts and Wholesale Market Prices, November 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 of Mexico Monthly Landings, Production, and Shipments of Fishery Products, August 1960; September 1960; 8 pp. each. (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, Texas, from Mexico; for the months indicated.

List of Primary Receivers of Imported Fishery Products and Byproducts, New York City, 1960, 19 pp. (Market News Service, 155 John St., New York 38, N. Y.) Contains the names and addresses of primary receivers of various types of imported fishery products and byproducts in the New York Metropolitan area and a numbered key to the different types of products handled.

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, November 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, October 1960; November 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; 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.

New England Haddock Fishery, and Marketing of Haddock Products, 1948-59, by John J. O'Brien, 36 pp., illus., processed. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston 10, Mass.) The purpose of this report is to summarize in one publication all the data scattered through many Market News Service reports and other publications relative to the New England haddock fishery and the marketing of haddock products, both domestic and foreign. Included are a brief analysis of the trends in the 1948-59 period and all the important developments that affected the fishery and the marketing of this species. Also included are statistical tables giving data on landings and ex-vessel prices, domestic fillet production, imports, cold-storage holdings, and wholesale and retail prices. Most data are for 1955-59, with some for previous years.

New York City's Wholesale Fishery Trade--Monthly Summary for October 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, October 1960; November 1960; 6 pp. each. (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 (Oreg.) wholesale dealers; also Northwest Pacific halibut landings; and Washington shrimp landings; for the months indicated.

THE FOLLOWING TECHNOLOGICAL LEAFLETS ARE AVAILABLE FROM THE BRANCH OF TECHNOLOGY, BUREAU OF COMMERCIAL FISHERIES, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON 25, D. C.

Bibliography of Publications of the Branch of Technology, Bureau of Commercial Fisheries, by Years and Authors, 1955-1959 Inclusive, by F. Bruce Sanford and Helen E. Plasting, Commercial Fisheries TL 30, 37 pp., August 1960. Includes listings of about 350 publications written by Branch of Technology personnel. Included are works published by the Bureau of Commercial Fisheries and the Department of the Interior, as well as those published by trade and professional journals.

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

Abundance and Life History of Shad, St. Johns River, Florida, by Charles H. Walburg, Fishery Bulletin 177 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), 19 pp., illus., printed, 20 cents, 1960.

Alaska Commercial Salmon Catch Statistics, 1951-1959, by Robert R. Simpson, Statistical Digest 50, 117 pp., processed, 60 cents, 1960. Contains Alaska commercial salmon catch statistics, in numbers of fish, by species, for the years 1951 through 1959. The data are presented in summary and in detailed form, showing total catch and catch by type of gear for all Alaska, for Alaska's three principal regions, for the management districts in each region, for the fishing districts in each management district, and for the statistical areas in each fishing district. Collection and tabulation of data on the fisheries of Alaska were the responsibility of the U. S. Bureau of Commercial Fisheries until the State assumed management of the fisheries on January 1, 1960. The statistical unit handling this type of data was formally transferred to the Alaska Department of Fish and Game in June 1960.

Alaska Fishery and Fur-Seal Industries, 1956, by Seton H. Thompson, Statistical Digest No. 45, 82 pp., illus., printed, 40 cents, 1960. Detailed reports and statistical tables on the operation and yield of the fishery industries are presented, with additional data on related subjects.

Fecundity of Red Salmon at Brooks and Karluk Lakes, Alaska, by Wilbur L. Hartman and Charles Y. Conkle, Fishery Bulletin 180 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), 12 pp., illus., printed, 15 cents, 1960.

Natural History of the Sandbar Shark, EULAMIA MILBERTI, by Stewart Springer, Fishery Bulletin 178 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 61), 42 pp., illus., printed, 35 cents, 1960.

Sonic Tracking of Adult Salmon at Bonneville Dam, 1957, by James H. Johnson, Fishery Bulletin 176 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), 19 pp., illus., printed, 20 cents, 1960.

Synopsis of Strigeoidea (Trematoda) of Fishes and Their Life Cycles, by Glenn L. Hoffman, Fishery Bulletin 175 (from Fishery Bulletin of the Fish and Wildlife Service, vol. 60), 35 pp., illus., printed, 30 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.

### ALGAE:

Marine Red Algae of Pacific Mexico; Part 3-Cryptone-maliae, Corallinaceae subf. Melobesioideae, by E. Yale Dawson, article, Pacific Naturalist (Contributions from the Beaudette Foundation for Biological Research), vol. 2, no. 1, October 24, 1960, 125 pp., illus., printed. Beaudette Foundation for Biological Research, Box 482, R.F.D. 1, Solvang, Calif.

### ALMANAC:

The American Ephemeris and Nautical Almanac for the Year 1962, 514 pp., printed, \$4. U. S. Naval Observatory, Nautical Almanac Office, Washington, D. C. (For sale by Superintendent of Documents, Government Printing Office, Washington 25, D. C.)

### ANADROMOUS FISHES:

Vernal and Hialal Races among Anadromous Fishes, by L. S. Berg, FRBC Trans. Ser. #206, 23 pp., illus., printed. (Reprinted from Journal of the Fisheries Research Board of Canada, vol. 16, no. 4, 1959, pp. 515-537.) Queen's Printer and Controller of Stationery, Ottawa, Canada, 1959.

### ANCHOVY:

"Experimental Study on Utilization of Food by Young Anchovy *Engraulis japonicus* temminch et schlegel," by M. Takahashi and M. A. Hatanaka, article, The Tohoku Journal of Agricultural Research, vol. 11, no. 2, July 1960, pp. 161-170, illus., printed. Library, Faculty of Agriculture, Tohoku University, Sendai, Japan.

### AQUATIC PLANTS:

Aquatic Plants of the Pacific Northwest with Vegetative Keys, by Albert N. Steward, La Rea J. Dennis, and Helen M. Gilkey, 184 pp., printed, \$2.50. Oregon State College, Corvallis, Oreg. Area studied includes Oregon, Washington, British Columbia, and Alaska.

### AUSTRALIA:

Fourth Annual Report of the Operation of the Fishing Industry Act 1956 During the Year Ended 30th June 1960, 4 pp., processed. Department of Primary Industry, Canberra, Australia. This report outlines the operations during the year ending June 30, 1960, of the Fisheries Development Trust Account, established for the purpose of financing activities designed to foster the development of the Australian fishing industry. Covers a shrimp trawling survey; exploratory trawling in the Great Australian Bight; and investigations of the barracuda and spiny lobster industries.

### BERING SEA:

"The Japanese and Russian Trawl Fishery in the Bering Sea," by Dayton L. Alverson, article, Western Fisheries, vol. 60, April 1960, pp. 12-14, 30-31, printed. Western Fisheries, Roy Wrigley Publications, Ltd., 1104 Hornby St., Vancouver 1, B. C., Canada.

### BIBLIOGRAPHIES:

Sources of Information on Mollusks, SIL-148 rev., 16 pp., processed. Smithsonian Institution, U. S. National Museum, Division of Mollusks, Washington 25, D. C.

Suggested Publications on Fishes (Africa--Fresh-water and Marine), SIL-171, 8 pp., processed. Smithsonian Institution, U. S. National Museum, Division of Fishes, Washington 25, D. C.

Suggested Publications on Fishes (Asia--Fresh-water and Marine), SIL-176, 5 pp., processed. Smithsonian Institution, U. S. National Museum, Division of Fishes, Washington 25, D. C.

Suggested Publications on Fishes (Europe--Fresh-water and Marine), SIL-172, 5 pp., processed. Smithsonian Institution, U. S. National Museum, Division of Fishes, Washington 25, D. C.

### BYPRODUCTS:

Preservation of Fish and Fish Offal for Oil and Meal Manufacture, by G. A. Carpenter and June Olley, Torry Technical Paper No. 2 (a revised version of Food Investigation Technical Paper No. 6), 34 pp., illus., printed, 35 cents. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y., 1960. Methods of preserving herring and white fish for meal and oil manufacture have been studied, with emphasis on sodium nitrite and formaldehyde as preservatives. Preservation should not be substituted for adequate processing, but rather should be used where material would otherwise be wasted, according to the authors. Formaldehyde and nitrite both react to a limited extent with fish protein to lower the biological value. Damage would be minimal with dipped whole fish but storage of minced material would not be satisfactory.

### CALIFORNIA:

California Fish and Game, vol. 46, no. 4, October 1960, pp. 379-520, illus., printed. Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif. Includes, among others, the following articles: "Review of the Abalone of California," by Keith W. Cox; "The Use of Anesthetics for the Handling and the Transport of Fishes," by William N. McFarland; and "Keys to the Freshwater and Anadromous Fishes of California," by J. B. Kimsey and Leonard O. Fish.

### CANADA:

Annual Report of the Department of Natural Resources of the Province of Saskatchewan for the Fiscal Year Ended March 31, 1960, 243 pp., illus., printed. Department of Natural Resources, Government Administration Bldg., Regina, Saskatchewan, Canada, 1960. A compilation of reports of the branches of the Saskatchewan Department of Natural Resources, including a 23-page report of the Fisheries Branch. The fisheries report covers activities in management, research, fish culture, and administration of commercial and sport fisheries. Statistical data are also given on fish production and value.

Fisheries Statistics of Canada, 1958 (Canada Summary), 33 pp. (tables), printed in English and French, 75 Canadian cents. Dominion Bureau of Statistics, Ottawa, Canada, November 1960. (For sale by

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Queen's Printer and Controller of Stationery, Ottawa, Canada.) This report provides a summary of the Canadian fisheries and the information is arranged to show separately the three main fisheries areas--Atlantic, Pacific, and Inland. It includes data on the quantity and value of the catch of selected fishery products for Canada; production of frozen, smoked, and pickled fish, canned fish and shellfish, and fishery byproducts; landings by trawlers and druggers; capital equipment in the primary fisheries operations; and employment in fish processing establishments; all for 1957-58. Also contains data on the quantity and value of exports and imports of fishery products; quantity and value of Canada's fishery products and byproducts, by provinces; Canada's canned lobster pack, by provinces; and salmon pack of British Columbia, by species; all for 1949-58. Fishing bounties paid to vessels and boats in 1958-59 are also tabulated.

#### CANNED TUNA:

"Identification of the Pink Pigment of Canned Tuna," by W. Duane Brown and A. L. Tappel, article, Food Research, vol. 22, March-April 1957, pp. 214-221, printed. Food Research, The Garrard Press, 510 North Hickory St., Champaign, Ill.

#### CHEMICAL COMPOSITION:

"Technical and Chemical Characteristics of the Atlantic Herring as Industrial Raw Material," by N. N. Rulev and A. P. Makarova, article, Rybnoe Khoziaistvo, vol. 35, no. 3, 1959, pp. 51-54, printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"Technical and Chemical Characteristics of Sardine Caught off the West African Coast," by N. N. Rulev, article, Rybnoe Khoziaistvo, vol. 35, no. 6, 1959, pp. 62-68, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

#### CONTAINERS:

"Aluminum in Packaging," article, Norwegian Fishing and Maritime News (Norwegian Fishing News), vol. 7, no. 3, 1960, pp. 35-37, illus., printed. Norwegian Fishing and Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway. Gives some interesting points from a paper on aluminum cans for processed foods presented at a British symposium on aluminum in packaging. Outlines the history of the use of this metal for cans, the various methods of manufacture, and details of the design of this type of container.

#### CRUSTACEA:

La Peche Maritime, vol. 39, no. 990, September 1960, illus., printed in French. Contains the following articles on crustaceans: "La Peche aux Crustaces a Camaret" (The Camaret Fishery for Crustaceans), by Pennec; "La Peche Langoustieye a Douarnenez" (The Spiny-Lobster Fishery at Douarnenez), by Bolopion; "Audierne, Port de Peche aux Crustaces" (Audierne, Port for the Crustaceans Fishery), by J. Couessel du Mesnil; and "Quelques Donnees sur les Possibilites de Peche de la Crevette a Madagascar" (Some Data on Possibilities of a Shrimp Fishery in Madagascar), by A. Crosnier and D. Charbonnier.

A Useful Method for Collecting Crustacea, by Raymond B. Manning, Contribution No. 272, 1 p., printed (Reprinted from Crustaceana, vol. 1, part 4, 1960.) The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla.

#### DECOMPOSITION:

"Chemical Indices of Decomposition in Ocean Perch," by Fred Hillig and others, article, Journal of the Association of Official Agricultural Chemists, vol. 43, May 1960, pp. 433-438, printed. Association of Official Agricultural Chemists, P. O. Box 540, Benjamin Franklin Station, Washington, D. C.

#### DELAWARE RIVER:

A Biological Evaluation of the Delaware River Estuary, by Carl N. Shuster, Jr., Information Series, Publication No. 3, 82 pp., illus., processed, \$1.25, limited edition. University of Delaware, Marine Laboratories, Lewes, Del., September 1959.

#### ELECTRICAL FISHING:

"Comparative Fishing with Electrical Gear" and "On the Value of Electrical Test Fishing," by H.W. Hattop, articles, Deutsche Fischerei-Zeitung, vol. 6, no. 1, 1959, pp. 18-28 and vol. 6, no. 2, 1959, pp. 47-49, respectively, printed in German. Deutsche Fischerei-Zeitung, Neumann Verlag, Radebeul/Dresden, East Germany.

#### FACTORYSHIPS:

"Factoryships--Development Trends of Sea Fisheries," by T. Kirstein, article, Gospodarka Rybna, vol. 2, no. 113, 1959, pp. 10-14, illus., printed in Polish. Gospodarka Rybna, Panstwowe Wydawnictwo Rolnicze i Lesne, Al. Jerozolimskie 28, Warsaw, Poland.

"Multiple Mechanization in Processing Herring on Board Mother-Factoryships," by N. G. Terent'eva, article, Rybnoe Khoziaistvo, vol. 34, no. 11, 1958, pp. 50-57, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"9,300 TDW Herring Mothership," by J. Staszewski and S. Paszkowski, article, Budownictwo Okretowe, vol. 4, no. 3, pp. 62-68, illus., printed in Polish. Budownictwo Okretowe, Wydawnictwa Czasospism Technicznych NOT, Czackiego 3/5, Warsaw, Poland.

#### FATTY ACIDS:

"Essential Fatty Acids Properties of Tuna, Herring, and Menhaden Oils," by O. S. Privett and others, article, Journal of Nutrition, vol. 71, May 1960, pp. 66-69, printed. Journal of Nutrition, The Wistar Institute of Anatomy & Biology, 36th St. at Spruce, Philadelphia 4, Pa.

#### FISH FARMING:

"Brackish Water Fish Farming," by J. M. Thomson, article, Fisheries Newsletter, vol. 19, no. 11, November 1960, pp. 17-20, illus., printed. Commonwealth Director of Fisheries, Department of Primary Industry, Canberra, Australia.

Trout Farming, by David B. Greenberg, 206 pp., illus., printed, \$12. Chilton Company, Book Division, Philadelphia 39, Pa. Presents, in highly readable form,

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the results of years of study and personal observation of commercial and Government hatcheries in Europe, Canada, Mexico, and the United States. This textbook on trout farming is lavishly illustrated with unusual photographs and action shots from all over the world. It is a "must" for present and prospective trout farmers, and it is a valuable text for students of fishery biology and for hatchery personnel. Relevant sections have been approved by commercial trout ranchers and Government hatchery specialists. The author's first-hand descriptions range from the world's largest trout farms in the Pacific Northwest to "fish-out" operations for anglers in the East. Other chapters include: history of artificial propagation; future of the trout industry; trout in nature; something of the anatomy, physiology, and embryology of a trout; brood trout and stripping; the incubation of trout eggs; in and about the hatchery building; ponds and raceways; feeding; sorting, grading, and transporting; your own trout pond; predators; trout diseases; going trout farms and their marketing methods.

#### FISH MEAL:

"New Technological Device for Producing Semi-Processed Fish Meal from Fat Fish Offals," by J. A. Kondakov, article, Rybnoe Khoziaistvo, vol. 35, no. 1, 1959, pp. 63-68, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

"Possibilities of the Utilization of Residues from the Manufacture of Fish Meal," by M. Ceamisi, article, Ind. Usoara, vol. 5, 1958, pp. 125-126, printed in Rumanian. Ind. Usoara, Bucharest, Rumania.

#### FISH MUSCLE:

"Nitrogen Extractive Substances of Fish Muscle," by S. E. Severin and P. L. Yul'fson, article, Biochemistry (U.S.S.R.), vol. 24, November-December 1959, pp. 923-929, printed. Biochemistry (Publication of the Academy of Sciences of the U.S.S.R.), Consultants Bureau, Inc., 227 W. 17th St., New York 11, N. Y.

#### FISH OILS:

"Effects of Diet on Fish Oil Toxicity in the Rat," by Benjamin H. Ershoff, article, Journal of Nutrition, vol. 71, May 1960, pp. 45-53, printed. Journal of Nutrition, The Wistar Institute of Anatomy & Biology, 36th St. at Spruce, Philadelphia 4, Pa.

En Nyvurdering av Medisintransens Betydning i Folkeer-naeringen - Fett og Hjertekarsykdommer (A New Outlook on Medicine - Fish-Liver Oil for Human Consumption), by Ragnar Nicolaysen, 16 pp., printed in Norwegian. A/S John Griegs Boktrykkeri, Fiskeridirektoratets Smaskrifter Nr. 2, Bergen, Norway, 1960.

"Toxicity of Fish Oil. III," by Noboru Matsuo, article, Seikagaku, vol. 20, 1957-58, pp. 769-772, printed. Tokyo Medical College, Tokyo, Japan.

"Use of Fish Oil Fractions in Reducing Elevated Blood-Cholesterol Levels," by Steele Culbertson, article, Feedstuffs, vol. 32, May 14, 1960, p. 66, printed. Feedstuffs, Miller Publishing Co., 118 South 6th St., Minneapolis 2, Minn.

#### FISH SPECIMENS:

Directions for Collecting, Preserving, and Shipping Fishes to the U. S. National Museum, 7 pp., proc-

essed. Smithsonian Institution, U. S. National Museum, Washington 25, D. C. Complete instructions are given for collecting specimens of fish - what to collect and methods of collecting. Instructions are also given for preserving fish specimens and preparing them for shipment to the U. S. National Museum.

#### FISHING GROUNDS:

"Fish Resources of the Davis Straits," by L. N. Pechenik, article, Rybnoe Khoziaistvo, vol. 35, no. 5, 1959, pp. 9-17, illus., printed in Russian. Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR Moscow, U.S.S.R.

#### FISHING NETS:

"The Manufacture of Fishing Nets of Cotton, Nylon, and Other Synthetic Fibers and Technical Aspects of Their Use," by A. Stagnaro, article, Bollettino di Pesca, vol. 10, no. 3/4, 1958, pp. 1-5, printed in Italian. Bollettino di Pesca, Laboratorio Centrale di Idrobiologia, Piazza Borghese, 91 Rome, Italy.

#### FLOUNDER:

"Salinity as a Factor in the Control of Growth and Survival of Postlarvae of the Southern Flounder, Paralichthys lethostigma," by Earl E. Deubler, Jr., article, Bulletin of Marine Science of the Gulf and Caribbean, vol. 10, no. 3, September 1960, pp. 338-345, illus., printed. The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

#### FOOD AND AGRICULTURE ORGANIZATION:

Catalogue of the Names of Fishes of Commercial Importance in the Mediterranean, 312 pp., illus., processed in French and English. Food and Agriculture Organization of the United Nations, General Fisheries Council for the Mediterranean, Rome, Italy, 1960.

The catalogue contains the common names of the fish of commercial importance in the Mediterranean and some imported species which are often available on Mediterranean markets. The catalogue contains for each language used in the Mediterranean one name (and only one) for each fish of commercial importance. It also includes drawing-sketches showing the main characteristics of each species of fish.

The Economic Role of Middlemen and Co-operatives in Indo-Pacific Fisheries, vol. 1, edited by E. F. Szczepanik, 135 pp., illus., printed, 7s. 6d. (US\$1.50). Food and Agriculture Organization of the United Nations, Rome, Italy, 1960. (Sold in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) Includes Part I, "Economic Survey of Fishing Industry in Thana District, Bombay State, India," by M. B. Desai and P. R. Batchwal; and Part II, "Economic Survey of Fishing Industry in Hong Kong," by E. F. Szczepanik. The two studies contained in this volume, one on some fishing villages in the Thana District of Bombay State in India, and the other on the experience of fishermen in Hong Kong, are the first two contributions to a program of research on the economic role of middlemen and cooperatives in Indo-Pacific fisheries, initiated by FAO in 1956 in collaboration with various Asian universities. Although the Bombay and the Hong Kong studies form two separate parts of this volume, they have been coordinated in such a way as to make possible direct comparison of the respective roles performed by the middlemen, the cooperative societies, and the Governments. Both studies make clear the advantages of

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of mechanization which tends to bring about a four-fold increase in output. By encouraging and facilitating mechanization, the cooperative movement can have an important, though indirect, effect on productive returns. Both studies, Indian and Hong Kong, provide illuminating analysis of investment, costs, revenue and profits, as well as a great deal of first-hand sociological information on the structure of the two fishing communities.

Expert Meeting on Fishery Statistics in the North Atlantic Area, September 22-30, 1959, 67 pp., processed. Food and Agriculture Organization of the United Nations, Rome, Italy, February 4, 1960. Includes proceedings, three agenda items discussed, and papers presented at an expert meeting on fishery statistics held in Edinburgh, Scotland. The agenda items consisted of: the requirements for statistical data by economists, scientists, technologists, and others; difficulties in meeting high priority requirements; and the solution of problems and further improvement in fishery statistics. Also included in the report are discussions by working parties on economic statistics; fish discarded at sea; statistics of fishing effort; FAO fishery statistical classification of aquatic animals and plants; FAO's standard international fishery commodity classification; and related topics.

A Report on the World Scientific Meeting on the Biology of Sardines and Related Species (Rome, September 13-21, 1959), 92 pp., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy. The objectives of the meeting were to appraise the status of knowledge on certain major aspects of the biology of sardines and related species; to examine and appraise the methods in research being used in the study of these aspects, and to indicate the lines along which national and international action might be developed, with a view to obtaining improvement in the methods and development of the research programs. The report states that "Since various species of sardines are found in most of the oceans of the world, the complexities of fisheries research methods require more cooperation and coordination between the nations of the world fishing sardines. Even though the differences in behavior and environment make it difficult to examine geographically widely separate groups of sardines, there are many problems of the research program which make cooperation on an international scale essential or highly desirable. Where closely related stocks are being studied by different countries, cooperation may be extended beyond methodology and might even be applied to such projects as understanding the environment in a spawning area or adjacent spawning areas, etc. It is quite apparent that widespread changes in hydrographic conditions occur at times. These have a profound effect on fishes. In order to develop hypotheses as to the effect of these environmental factors on abundance and accessibility, a method must be found for the free and rapid exchange of information and data." A list of the papers prepared and distributed during the meeting is presented.

The State of Food and Agriculture 1960, 188 pp., illus., printed, \$2. Food and Agriculture Organization of the United Nations, Rome, Italy, 1960. (For sale by the International Documents Service, 2960 Broadway, New York 27, N. Y.) Includes a section on fishery production and one on fishery policies.

#### Trilingual Dictionary of Fisheries Technological

Terms - Curing, 93 pp., printed in English, French, and Spanish, \$1. Food and Agriculture Organization of the United Nations, Rome, Italy, 1960. (For sale by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) This handbook is presented in the three official languages of FAO. The terms are arranged in alphabetical order according to the English language. Each term in English has been given an identification number; this consists of the letter of the alphabet with which the term begins, followed by a number which corresponds to the numerical position of the term under that particular letter. Terms and concepts are explained as concisely as possible, primarily to assist in the selection of the appropriate equivalents in any language.

Yearbook of Fishery Statistics, 1958-59 (International Trade), vol. X, 407 pp., processed in English, French, and Spanish, \$3.50. Food and Agriculture Organization of the United Nations, Rome, Italy, 1960. (Sold in United States by Columbia University Press, International Documents Service, 2960 Broadway, New York 27, N. Y.) This publication brings up to date the statistics relating to international trade in fishery products. It contains the same series of tables as the 1958 edition of the Yearbook; but coverage has been extended to include four new countries. The tables in this volume are divided into 7 groups of fishery commodities as defined in the FAO Fishery Statistical Classification. These groups are: fish, fresh, chilled, or frozen; fish, dried salted, or smoked; crustaceans and molluscs, fresh, dried, salted, etc.; fish, crustaceans, and molluscs, canned; fish, crustacean and mollusc preparations, not in airtight containers; aquatic animal oils and fats, crude or refined; and aquatic animal meals and similar products. The sections of the Yearbook containing these groups are preceded by 4 general summary tables and followed by notes and a table of conversion factors. Data are given in most tables for 1948 and for 1953 through 1959.

#### FOOD PREFERENCES:

Food Preferences of Men in the U. S. Armed Forces, by David R. Peryam and others, 172 pp., illus., processed. Quartermaster Food and Container Institute for the Armed Forces, 1819 W. Pershing Rd., Chicago 9, Ill., January 1960. Part of a series of food preference surveys, whose history and findings are the substance of the present report. When the surveys were initiated the objective was the practical one of obtaining information on food acceptance that would be useful in Service menu planning, particularly in the identification of suspected problem foods. This was accomplished by brief interim reports on each survey. But as the data accumulated it became evident that they had greater possibilities. It was then that the more extensive analyses, reported in this issue, were undertaken in order to exploit further this information, to determine its value and its limits in the statistical sense, and to seek out certain problems and approaches that might hold promise for future research.

#### FRANCE:

"La Congelation du Poisson et le Marche Francais" (The Fish-Freezing Industry and the French Market), by Orion, article, La Pêche Maritime, vol. 39, no.

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991, October 1960, pp. 615-617, illus., printed in French. La Peche Maritime, 190, Boulevard Haussmann, Paris, France.

Enquete Generale sur les Positions Statistiques des Usines Francaises de Conservees de Poissons des Cotes de la Manche et de l'Ocean au Cours de l'Annee 1959 (General Investigation of the Statistical Data from French Fish-Canning Plants on the English Channel and Atlantic Coasts during 1959), 7 pp., printed in French. Federation Nationale des Syndicats Francais de Conserveurs des Produits de la Mer, Paris, France.

"Observations sur le Hareng du Sud de la Mer du Nord et de la Manche Orientale, Campagne d'Hiver 1959/60" (Herring Observations in the Southern North Sea and Eastern English Channel, Winter Season 1959/60), by J. Ancellin, article, France Peche, vol. 5, no. 44, October 1960, pp. 57-59, 64, printed in French. France Peche, Tour Sud-Est, Rue de Guemene, Lorient, France.

"Le XVII<sup>e</sup> Congres des Peches et Industries Maritimes s'Est Tenu a Lorient, du 4 au 9 Octobre" (The 17th Congress of Fisheries and Marine Industries was Held at Lorient, October 4-9), article, La Peche Maritime, vol. 39, no. 991, October 1960, pp. 585-604, illus., printed in French. La Peche Maritime, 190, Boulevard Haussmann, Paris, France.

#### FUR SEALS:

"The Northern Fur Seals," by Ford Wilke, article, Alaska Sportsman, vol. 26, no. 12, December 1960, pp. 16-18, illus., printed. Alaska Sportsman, Alaska-Northwest Publishing Co., Juneau, Alaska. Discusses briefly the northern fur seals, their breeding grounds and migratory habits.

#### GEAR:

"The Mechanization of Fresh-Water Fishery by the End of 1958," by G. Schmidt, article, Deutsche Fischerei-Zeitung, vol. 6, no. 5, 1959, pp. 140-143, printed in German. Deutsche Fischerei-Zeitung, Neumann Verlag, Radebeul/Dresden, East Germany.

#### GENERAL:

Journal du Conseil, vol. 25, no. 3, August 1960, pp. 235-337, illus., printed. Conseil Permanent International pour l'Exploration de la Mer, Charlottenlund Slot, Denmark. Contains, among others, articles on: "The Effect of Three Different Types of Growth Curves on Estimates of Larval Fish Survival," by David A. Farris; "Fish Schooling: A Possible Factor in Reducing Predation," by Vernon E. Brock and Robert H. Riffenburgh; and "Mesh Selection Factors in the Trawl Fishery off Tropical West Africa," by Alan R. Longhurst.

#### GENERAL AGREEMENT ON TARIFFS AND TRADE:

Negotiations Under the Trade Agreements Act of 1934 as Amended and Extended (Supplementary Notice of U. S. Intention to Negotiate; Supplementary List of Products to be Considered for Possible U. S. Concessions; Notice of Supplementary Public Hearings), Department of State Publication 7105, 24 pp., processed, 15 cents. Interdepartmental Trade Agreements Organization, Washington, D. C., November 1960. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C.)

#### GERMAN FEDERAL REPUBLIC:

Jahresbericht uber die Deutsche Fischwirtschaft, 1959 (Annual Report on German Fisheries, 1959), 294 pp., illus., printed in German with English summaries, DM 25 (about US\$6). Verlag Gebr. Mann, Hauptstrasse 26, Berlin-Schoenberg, Germany, October 1960. A review covering all phases of the German fisheries in 1959. Each chapter is followed by a summary in English and all statistical tabulations have English subcaptions. Issued by the Ministry of Food, Agriculture, and Forestry, which includes the Fisheries Directorate. Part I contains information on fishery policy in 1959, the second United Nations Conference on the Law of the Sea, landings, the fishing fleet, foreign trade in fish and shellfish, and consumption of fishery products. Part II includes information on cruises of the fishery protection vessels and fishery research vessel, the vocational seamen's association, the work of the German Scientific Commission for the Exploration of the Sea, and fishery research. Part III presents data on the German deep-sea fishery in 1959, the lugger herring fishery, cutter deep-sea and coastal fisheries, fresh-water fisheries, the fish processing industry, publicity campaign for sea-fish in 1959/60, and promotion of fish marketing. Part IV gives data on foreign fisheries and whaling.

#### GERMANY:

"Die Binnenfischerei in Schleswig-Holstein" (The Inland Fisheries of Schleswig-Holstein), by A. Pape, article, Statistische Monatshefte Schleswig-Holstein, vol. 9, no. 10, October 1957, pp. 309-318, printed in German. Statistisches Landesamt Schleswig-Holstein, Kiel, Germany.

"Mittlere Reiseertrage Deutscher Fischdampfer 1887-1955 und Berechnung Vergleichbarer Einheitsertrage" (Average Trip Production of German Large Trawlers, 1887-1955, and Calculation of Comparable Unit Output), by J. Lundbeck, Mitteilungen aus dem Institut fur Seefischerlei, no. 10, 130 pp., printed in German. Institut fur Seefischerlei, Hamburg, Germany, 1960.

#### GLASS FLOATS:

"Hydrodynamic Studies on the Resistance of Spherical Glass Floats for Fishing Net. I--Comparison of the Drag Coefficients of the Floats having Various Coverings and Diameters with that of the Sphere," by Takeo Taniguchi, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, no. 11, 1958, pp. 696-699, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Minato-ku, Tokyo, Japan.

#### GUTTING MACHINE:

"Machine for Gutting Small Fish," by V. P. Chivilenko and I. I. Vedernikov, article, Rybnoe Khoziaistvo, vol. 34, 1958; pp. 62-64, printed in Russian. (Translation published for the National Science Foundation and the Department of the Interior, Washington, D. C., by the Israel Program for Scientific Translations PST Cat. No. 68, OTS 60-21096). Rybnoe Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

#### HALIBUT:

"The Halibut," article, Sportsmen's Life, vol. 11, no. 12, December 1960, pp. 18-20, illus., printed. Sportsmen's Life, Essay Publishing Company, Inc., Post Office Building, 20 Whitehouse Ave., Roosevelt, N. Y.



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Easy-to-read description of the "king" of the flatfish. The classification, geographic and vertical ranges, identification details, color pattern, size, habits, enemies, spawning, growth and commercial and sport-fishing importance of the halibut are discussed.

Utilization of Pacific Halibut Stocks: Yield per Recruitment, Report No. 28, 52 pp., illus., processed. International Pacific Halibut Commission, Fisheries, Hall No. 2, University of Washington, Seattle 5, Wash., 1960.

#### HONDURAS:

Import Tariff System of Honduras, WTIS, Part 2, Operations Report no. 60-52, 2 pp., printed, 10 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

#### INDUSTRIAL MANAGEMENT:

Keeping Overhead Costs in Line, by George J. Tasso, Management Aids for Small Manufacturers No. 118, 4 pp., processed. Small Business Administration, Washington 25, D. C., November 1960.

#### INTERNATIONAL COMMISSIONS:

International Commission for the Northwest Atlantic Fisheries, Proceedings of the Joint Scientific Meeting on Fishing Effort, the Effect of Fishing on Resources, and the Selectivity of Fishing Gear, May 27-June 3, 1957, vol. 1, 45 pp., printed. International Commission for the Northwest Atlantic Fisheries, Halifax, N. S., Canada, 1960.

International Commission for the Northwest Atlantic Fisheries, Statistical Bulletin for the Year 1958, vol. 8, 69 pp., illus., printed. International Commission for the Northwest Atlantic Fisheries, Halifax, N. S., Canada, 1960. This bulletin is divided into two parts: Part 1 summarizes statistics on fishery landings in the Convention Area 1952-1958; and Part 2 includes statistics dealing with the fisheries in 1958. The presentation of the basic statistical data again has been designed to place emphasis on area and month of fishing. Contains a summary of all the landings by species group, country, and statistical subdivision; landings of cod, haddock, ocean perch, halibut, and flounder for each type of gear; and landings of each species by subarea.

#### IRELAND:

Report on the Sea and Inland Fisheries for the Year 1958 (Incorporating Statistics of the Capture of Salmon, Sea Trout and Eels, and Certain Scientific Papers Relating to Fisheries), 86 pp., illus., printed, 4s.6d. (about 63 U. S. cents). Government Publications Sale Office, G. P. O. Arcade, Dublin, Ireland. This report covers the activities of the Fisheries Division of the Department of Lands, and includes information and statistics on the quantity and value of Ireland's sea and inland fish and shellfish for 1958, and related data. Also includes, among others, sections on salmon of the River Corrib in 1956-58; the Irish herring fishery, 1958/59; and lobster storage in Ireland.

The Seventh Annual Report and Accounts of the Sea Fisheries Board for the Year Ended March 31, 1959,

24 pp., illus., printed in Irish and English. An Bord Iascaigh Mhara, 67 Lower Mount St., Dublin, Ireland.

#### IRRADIATION PRESERVATION:

"The Preservation of Fish with Ionizing Radiation: Bacterial Studies," by Donald P. MacLean and Camille Welander, article, Food Technology, vol. 14, May 1960, pp. 251-254, printed. Food Technology, The Garrard Press, 510 North Hickory, Champaign, Ill.

Radiation Technology in Food, Agriculture and Biology, by Norman W. Desrosier and Henry M. Rosenstock, 425 pp., printed, \$12.50. AVI Publishing Co., Inc., Box 388, Westport, Conn., 1960. Covers the effects of radiation on single cells, plants, animals, and food, and in promoting useful chemical reactions. The latest commercial equipment, measurement and control of dosage, safety measures, and detailed cost studies are also discussed.

#### ISRAEL:

Fishermen's Bulletin, vol. 3, no. 5, September 1960, 36 pp., illus., printed in Hebrew with English abstracts. Fishermen's Bulletin, P. O. B. 699, Haifa, Israel. Includes, among others, these articles: "Drawings of Boats in Geometric Style (I)," by M. Sas; "Fish Conservation and Related Economic Problems (II)," by E. Gottlieb; "Mugil Species in the Rivers of Israel," by L. Bograd Zismann; and "The Boats Tell Stories," by D. Shmida.

#### JAPAN:

Collected Reprints, 1959 (from the Tokai Regional Fisheries Research Laboratory), 159 pp., illus., printed in Japanese with English summaries. Tokai Regional Fisheries Research Laboratory, Tsukishima, Chuo-ku, Tokyo, Japan. Includes, among others, the following articles: "Experimental Fishing Test on the Efficiency of Double Gill Net," by M. Nomura; "Studies on the Viscosity of Fish Actomyosins. I--Some Fundamental Problems on the Viscosity of Actomyosin. II--Viscosity Change of Carp Actomyosin Solution on Storage," by M. Migita and T. Suzuki; "Influence of Death Conditions Upon Muscle Proteins. I--Composition of Myosins from Carps Killed Instantly and in Anguish," by M. Migita and S. Otake; "Studies on the Economical Manufacture of Vitamin A Concentrate from Fish Liver Oil. VIII--Chromatographical Separation of Vitamin Concentrates," by Y. Shimma and M. Tanaka; "Studies on the Economical Manufacture of Vitamin A Concentrate from Fish Liver Oil. IX--Purification of Vitamin A Concentrate with Methanol. X--Absorption by Weakened Acid Clay," by H. Higashi and others; "Riboflavin Contents in the Liver of Fish," by H. Higashi, S. Murayama, and K. Tabei; "Nutritive Elements in Salted Marine Appetizers," by H. Higashi, R. Kikuchi, and K. Tabei; and "Nutritive Value of Fin Whale Meat," by T. Kaneda, H. Sakai, and S. Ishii.

Japanese Fisheries: Their Development and Present Status, no. 37, 255 pp., illus., printed. Asis Kyokai, Akasaka-Shinsaka-machi, Minato-ku, Tokyo, Japan, 1960 (Revised). A comprehensive report on current development of the fishing industry in Japan. Contains sections contributed by various offices of the Japanese Fisheries Agency. Included is information on general aspects of fisheries in Japan, fishing gear and methods, vessels, inland fisheries, shallow-sea fish-

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eries, pearl culture, refrigeration in the fishing industry, canning of fishery products, and fish-jelly products. Also included are sections on marketing and transportation, foreign trade, educational and research institutions, Japanese fishery resources, economics of the fishing industry, cooperatives, public administration in the industry, and fisheries statistics. An appendix containing statistical tables of data on fishery production, vessels, distribution, consumption, prices and other topics is presented. Most of the data is for 1958, with some for 1959 and for previous years.

#### LAW OF THE SEA CONFERENCE:

2nd United Nations Conference on the Law of the Sea.  
United Nations, New York, N. Y.

A/CONF. 19/8., Summary Records of Plenary Meetings and Meetings of the Committee of the Whole, Annexes and Final Act, 176 pp., \$2.50, September 1960. International Documents Service, Columbia University Press, 2960 Broadway, New York 27, N. Y.

#### LIVER OIL:

"Shark-Liver Oil. I--Physicochemical Constant and Vitamin A Content of Liver Oil from Sharks of the Karachi Coast," by S. Masood Ali, S. Abdul Haq, and S. Mahdihassan, article, Pakistan Journal of Science and Industrial Research, vol. 1, 1958, pp. 70-72, printed. Pakistan Council of Science and Industrial Research, Karachi, Pakistan.

#### MARINE BENTHOS:

Marine Infaunal Benthos in Arctic North America, by Derek V. Ellis, Technical Paper No. 5, 56 pp., illus., printed. Arctic Institute of North America, 3485 University St., Montreal 2, Que., Canada, September 1960. Quantitative surveys of marine infaunal benthos were made in north Baffin Island during 1954 and 1955, in Greenland during 1956, and in Foxe Basin during 1957. The marine benthos can be arbitrarily separated into infauna, animals living on or in level (soft) sea bottom, and epifauna, animals living on or attached to hard surfaces. The distribution and standing crops of infaunal species are described, using the concept of marine level-bottom communities which is a particularly useful way of summarizing the infauna of arctic regions. The distribution of epifaunal species collected is shown in the appendix.

#### MARINE BIOLOGY:

Journal of the Marine Biological Association of the United Kingdom, vol. 39, no. 3, October 1960, pp. 417-767, illus., printed, \$11. Cambridge University Press, 32 E. 57th St., New York 22, N. Y., includes, among many others, these articles: "The Effects of Salinity on the Developing Eggs and Larvae of the Herring," by F. G. T. Holliday and J. H. S. Blaxter; "The Effect of Extremes of Temperature on Herring Larvae," by J. H. S. Blaxter; and "Red Blood Values in the Plaice (Pleuronectes platessa L.)," by A. Preston.

#### MARINE FAUNA:

Creatures of the Sea, by William B. Gray, 209 pp., illus., printed, \$3.95. Wilfred Funk, Inc., 33 W. 46th St., New York 36, N. Y.

#### MARINE MICROBIOLOGY:

Cellulolytic Activity of Lignicolous Marine Ascomycetes and Deuteromycetes, by Samuel P. Meyers and Ernest S. Reynolds, Contribution No. 267, 12 pp., illus., printed. The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

#### MARINE OILS:

"Acidolysis of Vegetable and Marine Oils with Phthalic Acids," by E. F. Carlston, article, Journal of the American Oil Chemists' Society, vol. 37, July 1960, pp. 366-371, printed. The American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

"Glycerolysis of Marine Oils and the Preparation of Acetylated Monoglycerides," by Edward H. Gruger, Jr., Donald C. Malins, and Erich J. Gauglitz, Jr., article, Journal of the American Oil Chemists' Society, vol. 37, May 1960, pp. 214-217, printed. The American Oil Chemists' Society, 35 E. Wacker Dr., Chicago 1, Ill.

#### MEETINGS AND PROCEEDINGS:

"Los Armadores del Occidente Europeo Examinan la Situación de la Pesca--Importante Reunion en Hamburgo" (The Boatbuilders of Western Europe Examine the Position of the Fisheries--Important Meeting in Hamburg), by G. Lefebvre, article, Puntal--Revista Marítima y Pesquera, vol. 7, no. 79, October 1960, pp. 4-5, illus., printed in Spanish. Puntal--Revista Marítima y Pesquera, Apartado 316, Alicante, Spain.

#### NAVIGATION EQUIPMENT:

"Electronics for Fishing," by P. Ilardi, article, Bollettino di Pesca, vol. 10, no. 3/4, 1958, pp. 5-9, printed in Italian. Bollettino di Pesca, Laboratorio Centrale di Idrobiologia, Piazza Borghese, 91, Rome, Italy.

#### NETHERLANDS NEW GUINEA:

"Modern Craft for Papuan Fishermen," by Claude Belloni, article, South Pacific Bulletin, vol. 10, no. 4, October 1960, pp. 42-43, illus., printed. South Pacific Commission, Box 5254, G. P. O., Sydney, Australia.

#### NIGERIA:

Import Tariff System of Nigeria, WTIS, Part 2, Operations Report no. 60-48, 2 pp., printed, 10 cents. Bureau of Foreign Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

#### NORWAY:

"Norwegian Change-Over to New Fishing Methods--The BMV Sterntrawler," article, Norwegian Fishing and Maritime News (Norwegian Fishing News), vol. 7, no. 3, 1960, pp. 17, 19, 21, illus., printed. Norwegian Fishing and Maritime News, P. O. Box 740, Slottsgt. 3, Bergen, Norway.

"Rapport fra Sildeundersøkelsen ved Island 2/6-8/7 1960 med F/F G. O. Sars" (Report on Herring Investigation off Iceland June 2-July 8, 1960, with the G. O. Sars), by O. J. Ostvedt, article, Fiskets Gang, vol. 46, no. 44, November 3, 1960, pp. 611-616, illus., printed in Norwegian. Fiskets Gang, Postgato nr. 691 81, Bergen, Norway.

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

"Sammenliknende Undersøkelser Vintersildsesongen 1960 over Fangstresultatene ved Bruk av Snurpenoter av Kunstfibre (Nylon/Terylene) Kontra Snurpenoter av Bomull" (Comparison Research on 1960 Season Winter Herring Catch with Use of Synthetic Fiber Purse Seine Against Cotton Purse Seine), article, *Fiskets Gang*, vol. 46, no. 39, September 29, 1960, pp. 551-554, printed in Norwegian. *Fiskets Gang*, Postgiro nr. 691 81, Bergen, Norway.

Sett Kursen for Fiskeravgskolen (Establish Course for the Fishery School), *Fiskeridirektoratets Smakrifter* Nr. 4, 22 pp., illus., printed in Norwegian. A/S John Griegs Boktrykkeri, Bergen, Norway, 1959.

"Stortralernes Fiske i 1959" (Large Trawler Fishery in 1959), by Sverre Møllestad, article, *Fiskets Gang*, vol. 46, no. 45, November 10, 1960, pp. 628-634, illus., printed in Norwegian. *Fiskets Gang*, Postgiro nr. 691 81, Bergen, Norway.

#### OCEANOGRAPHY:

Turbulent Diffusion in the Sea, by Richard Bourret and Saul Broida, *Contribution No. 282*, 13 pp., illus., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 10, no. 3, September 1960, pp. 354-366.) The Marine Laboratory, University of Miami, #1 Rickenbacker Causeway, Miami 49, Fla.

#### OYSTERS:

"Louisiana Oyster Crop," article, *Louisiana Conservationist*, vol. 13, no. 10, October 1960, pp. 2-4, illus., printed. Louisiana Wild Life and Fisheries Commission, 400 Royal St., New Orleans 16, La. Describes how a million barrels of oyster shells were planted by the Wild Life and Fisheries Commission in an effort to help the Louisiana oyster industry.

#### PARASITES:

A List of Parasites from Marine and Coastal Animals of Florida, by Robert F. Hutton and Franklin Sogandares-Bernal, *Contribution No. 38*, 6 pp., printed. (Reprinted from *Transactions of the American Microscopical Society*, vol. 79, no. 3, July 1960, pp. 287-292, printed. Florida State Board of Conservation, Marine Laboratory, Maritime Base, Bayboro Harbor, St. Petersburg, Fla.

#### PLANKTON:

Plankton of the Florida Current. Part VI--The Chaetognaths, by Harding B. Owre, *Contribution No. 275*, 68 pp., illus., printed. (Reprinted from *Bulletin of Marine Science of the Gulf and Caribbean*, vol. 10, no. 3, September 1960, pp. 255-322.) The Marine Laboratory, University of Miami, Virginia Key, Miami 49, Fla.

#### POULTRY FEED:

Effect of Origin, Processing and Storage on the Undifferentiated Growth Factor Activity of a Variety of Fish Meals, by T. W. Sullivan and others, 5 pp., illus., printed. (Reprinted from *Poultry Science*, vol. 39, no. 4, July 1960, pp. 1037-1041.) Poultry Science Association, Kansas State College, Manhattan, Kans.

#### PRESERVATION:

"Availability of Hinokitiol for the Preservation of Fish," by Eizaburo Noguchi and Joji Yamamoto, article, *Bulletin of the Japanese Society of Scientific Fisheries*, vol. 24, nos. 6 and 7, 1958, pp. 524-530, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chôme, Minato-ku, Tokyo, Japan.

#### REFRIGERATION:

"Changes in the Adenosinetriphosphatase Activity and Sulphydryl Groups of Cod Flesh During Frozen Storage," by J. J. Connell, article, *Journal of the Science of Food and Agriculture*, vol. 11, May 1960, pp. 245-249, printed. *Journal of the Science of Food and Agriculture*, Society of Chemical Industry, 14 Belgrave Square, London, S. W. 1, England.

#### SEA LIONS:

"California's Controversial Sea Lions," by Richard S. Coker, article, *Outdoor California*, vol. 21, nos. 9-10, September-October 1960, pp. 14-16, illus., printed. Department of Fish and Game, 722 Capitol Ave., Sacramento 14, Calif. The history of agitation to do away with sea lions in California dates back to 1899. In all cases, proposals for population reductions have been met by counterreaction. Recorded high point of the sea lion population in California was in the 1850's. From about 1860 to 1870 many thousands were killed and rendered for oil. An era of protection followed. By 1899 another move to reduce the herds had started. There was a protection move in 1909, followed in 1927 by a reverse trend. This article discusses developments in recent years--pressures of human population, sea lion predation, gear loss, the economics of sea lion population control, present law concerning sea lions, and the California herds.

#### SEAGRASS:

Observations on the Ecology and Distribution of the Florida Seagrasses, by Ronald C. Phillips, *Professional Papers Series No. 2*, 76 pp., illus., printed. Florida State Board of Conservation, Marine Laboratory, St. Petersburg, Fla., October 1960.

#### SHRIMP:

"Notes on the Artificial Cultivation of Fresh Water Shrimp," by Robert M. Ingle and Bonnie Eldred, article, *West Indies Fisheries Bulletin*, no. 4, July-August 1960, pp. 1-5, processed. Ministry of Natural Resources and Agriculture, Federal House, Port-of-Spain, Trinidad, W. I. (Also *Contribution No. 39*, Marine Laboratory, Florida State Board of Conservation, St. Petersburg, Fla.) Results of a study of the basic biology and ecology of fresh-water shrimp (*Macrobrachium acanthurus* and *M. carcinus*). In conclusion, the authors state that (1) biologically, fresh-water shrimp offer several advantages for artificial cultivation; and (2) economically, the species is an attractive one for artificial cultivation.

The Poole Prawn Pot, Laboratory Leaflet No. 10, 5 pp., illus., processed. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, England, 1956. Presents drawings and construction data

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on the Poole prawn (shrimp) pot. A number of different types of pot are used for catching prawns on England's south coast. Most of these and a few others were tested for their catching capabilities in large tanks at the Experiment Station, Conway, and the Poole pot gave the best results.

**Shrimping Grounds Along the North Coast of Wales,** Laboratory Leaflet No. 7, 7 pp., illus., processed. Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, England, 1955. The results of the monthly sampling at Rhyl, Colwyn Bay, Conway, and Penmaenmawr are shown diagrammatically. They indicate that shrimps are plentiful along the coast from Rhyl to Penmaenmawr, and that commercially-profitable catches are to be obtained in this area. The survey shows, however, that shrimp are far less abundant on the southwest coast of Anglesey, Criccieth, and Portmadoc, and that they could not support a fishery in these areas.

"Tagged Shrimp Swims 100 Miles," article, *Louisiana Conservationist*, vol. 13, no. 10, October 1960, pp. 19-20, illus., printed. Louisiana Wild Life and Fisheries Commission, 400 Royal St., New Orleans 16, La.

#### SMALL CRAFT:

**Proceedings of the International Economic Conference on Small Craft for Fisheries and Transportation,** 24 pp., illus., printed. Outboard Marine Corp., Waukegan, Ill. Contains, among others, the following papers presented at the Conference held on May 24, 1960, in New York City: "Outboard Mechanization in Fisheries," by Jan-Olaf Traung; "The Outboard Boat--History and Development," by Philip L. Rhodes; "Financing Boat Mechanization," by Edwin D. Kirby; "Puerto Rican Program of Credit and Training for Fishermen," by Felix Inigo; and "Mechanization of Small Craft for Fisheries and Transportation in Uganda and Its Effects," by Alloys P. Achieng.

#### SPAIN:

**Estadística de Pesca, Año 1959 (Fishery Statistics, 1959),** 278 pp., printed in Spanish. Ministerio de Comercio, Direccion General de Pesca Maritima, Madrid, Spain, 1960.

#### STERN TRAWLERS:

"Further Improvement of Big Stern Trawlers with Freezing Installations," by S. L. Fridman, article, *Rybnoc Khoziaistvo*, vol. 35, no. 6, 1959, pp. 38-41, printed in Russian. Rybnoc Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

#### SUBMARINES FOR FISHERY RESEARCH:

"Experimental Cruises Aboard the Submarine Sievierianke," by V. P. Zaitsev and V. G. Azhazha, article, *Rybnoc Khoziaistvo*, vol. 35, no. 7, 1959, pp. 7-16, illus., printed in Russian. Rybnoc Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R. The Soviet Federal Institute of Oceanography and Fisheries has been undertaking systematic cruises aboard the submarine Sievierianke since December 1958 to investigate the habitat of commercial fishes and their behavior during fishing. Two cruises to the Barents Sea and one to the North Atlantic have already been made, covering a total distance of over 4,000 nautical miles under water.

Systematic studies were carried out on fish schools, photographs shot, bottom and water samples taken, and water temperature measured at various depths. In general, the studies indicate that: (a) a submarine is suitable for such studies, and the Sievierianke is well adapted; (b) research can be carried out under any weather conditions and is not hindered by surface waves; (c) very strong waves were perceptible up to 50 m. depth; (d) the vessel could easily enter fish schools though it scattered them; and (e) observations made through the bulleyes were comparable to those made with echo sounders.

"First Experiment with Submarine for Observing the Behavior of Herring," by D. V. Radakov and B. S. Soloviev, article, *Rybnoc Khoziaistvo*, vol. 35, no. 7, 1959, pp. 16-21, illus., printed in Russian. Rybnoc Khoziaistvo, VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R. Describes the results obtained by the submarine Sievierianke in the Norwegian Sea. The research cruise lasted from December 29, 1958, to January 21, 1959. The purpose was to determine the kind of observations that could be made from the submarine on winter herring. The behavior was different on different days and at different times of the day. The herring were rather restful and even motionless. The majority was in a normal position, but part of them were resting with their heads downwards or upwards, and even with their bellies upwards. The herring rose upwards toward the evening. Fish in schools were usually more active and quickly swam across the field of visibility of the bulleyes. The herring started to grow more and more agile in the evening and continued throughout the night, reaching a peak at dawn when their agility began to fall. When the light was switched on and off they did not move away from the field of illumination during the first half of the night, but they showed a negative reaction to the electric light during the second half and at daytime. This reaction grew stronger at dawn. The assumption of passive behavior of winter herring was confirmed. Quantitative data describing the degree of agility of the herring and the growing agility throughout the night were obtained. It may be inferred that drift nets catch fish merely during their agility period, particularly during their vertical migration in the evening and at dawn. Although the facts obtained during the experiments should be more closely scrutinized, the short period during which they were obtained promises great possibilities for research with submarines on the behavior of fish.

#### TARIFFS AND TRADE:

**Public Notice of Investigation and Hearings (Investigation No. 9--Supplement A Under Section 3 of the Trade Agreements Extension Act of 1951, as Amended, and Section 332 of the Tariff Act of 1930, with Respect to Supplemental List of Articles for Consideration in Proposed Trade Agreements Negotiations with Contracting Parties of GATT),** 3-9--Suppl., 5 pp., processed. United States Tariff Commission, Washington 25, D. C., November 22, 1960.

**Tariff Classification Study, Submitting Report,** TC Miscellaneous Series, 89 pp., printed, 35 cents. United States Tariff Commission, Washington, D. C., November 15, 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.) This is the final report on the Tariff Classification Study which includes the text of proposed

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tariff schedules. The Study, which comprises 10 volumes, is being submitted to the President and to the Chairmen of the Committee on Finance of the Senate and of the Ways and Means Committee of the House of Representatives. Legislation will be required to make the proposed tariff schedules effective. The classification provisions are organized into 8 schedules, in contrast with the present 16. Some proposed changes in rates for fishery products are included in this report.

#### TAX GUIDE:

Tax Guide for Small Business, 1961 Edition, 144 pp., printed, 40 cents. Internal Revenue Service, Washington, D.C., November 1960. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.)

#### TERRAPIN:

"A Turtle of Taste," by George K. Reid, article, Natural History, vol. 69, no. 10, December 1960, pp. 23-27, illus., printed. The American Museum of Natural History, Central Park W. at 79th St., New York 24, N. Y. Discusses the life cycle, occurrence, and "family history" of the diamondback terrapin. Birds, beasts, and gastronomes relish this tasty reptile, says the author.

#### TROCHUS SHELL:

"1957 Trochus Transfer to Cooks Apparently Successful," by Louis Devambe, article, South Pacific Bulletin, vol. 10, no. 4, October 1960, pp. 31, 36, illus., printed. South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. Early in 1957, acting on the advice of the South Pacific Commission's fisheries officer, the Cook Islands Administration arranged for two transfers of live trochus by air from Fiji to Aitutaki Island. Now, with the arrival at Commission headquarters from the Cook Islands of a young trochus shell comes probable proof that the original stock there is actually breeding, states the author.

#### TROLLING:

"Mechanical Characteristics of Plate Depressors for Trolling," by Noboru Isouti and Tasae Kawakami, article, Bulletin of the Japanese Society of Scientific Fisheries, vol. 23, nos. 7 and 8, 1957, pp. 354-357, printed in Japanese and English. Japanese Society of Scientific Fisheries, c/o Tokyo University of Fisheries, Shiba-kaigandori 6-chome, Minato-ku, Tokyo, Japan.

#### TUNA:

"La Explotacion de Tunidos en Espana, su Momento Actual" (Current Spanish Development of Tuna Resources), by Angel Gonzalez Rodal, article, Industria Conservera, vol. 26, no. 255, September 1960, pp. 245-248, printed in Spanish. Industria Conservera, Calle Marques de Valladares, 41 Vigo, Spain.

Premieres Donnees sur le Thon a Nageoires Jaunes en Nouvelle-Caledonie (First Studies on the Yellowfin Tuna in New Caledonia), by M. Legand and R. Desrosieres, Institut Francais d'Océanie, Rapport Scientifique no. 11, 80 pp., illus., processed in French. Office de la Recherche Scientifique et Technique Outre-Mer, 20, Rue Monsieur, Paris 7<sup>e</sup>, France, 1960.

"Rapport over Storje, Hibrann-, Pigghaundersokelser med F/F G. O. Sars i Omradet: Irland, Shetland, Faeroyene, Norskekysten i Tiden 21 Juli-18 August

August 1960" (Report on Exploratory Fishing Cruise for Tuna on the G. O. Sars off Ireland, the Shetlands, Faroes, and the Norwegian Coast, July 21-August 18, 1960), article, Fiskets Gang, vol. 46, no. 43, October 27, 1960, pp. 600-602, illus., printed in Norwegian. Fiskets Gang, Postgiro nr. 691 81, Bergen, Norway.

"Tuna Fishing on Board Shinio Maru (December 1958-January 1959)," by Y. Carmel, article, Fishermen's Bulletin, no. 19, pp. 15-17, illus., printed in Hebrew. Fishermen's Bulletin, Sea Fisheries Research Station, P. O. Box 699, Haifa, Israel.

#### TUNA CLIPPERS:

Transverse Stability of Tuna Clippers, by J. Pauling, Jr., 14 pp., illus., processed. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy, 1959. Paper read at the Second World Fishing Boat Congress, Rome, April 5-10, 1959.

#### TUNA LONG-LINER:

"Les Ateliers et Chantiers de la Manche Lancent le Thonier-Palangrier Congelateur Daguite pour Israel" (The Firm of Les Ateliers et Chantiers de la Manche Launches the Tuna Long-Liner Freezer Daguite for Israel), article, La Peche Maritime, vol. 39, no. 990, September 1960, pp. 521-522, illus., printed in French. La Peche Maritime, 190, Boulevard Haussmann, Paris, France.

#### TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. 8, no. 10, October 1960, 32 pp., illus., printed in Turkish with English table of contents. Balik ve Balikcilik, Istanbul Balikcilik, Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, the following articles: "On the Production and Preservation of Caviar, Fish Eggs, and Fish Milk," by Hikmet Akgunes; "On Lobsters (Part II)," by Sitki Uner; and "A Delicious Sea Weed."

#### UNITED KINGDOM:

Hygiene in the Retail Fish Trade; The Hygienic Transport and Handling of Fish, Food Hygiene Codes of Practice Nos. 3 and 4; 20 pp. and 16 pp., respectively, 20 cents each. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y., 1960.

#### U.S.S.R.:

The following translations are obtainable from the Office of Technical Services, Department of Commerce, Washington 25, D. C., at a minimum cost of 50 cents for short articles or an approximate cost of 1 cent per page for articles and books of more than 50 pages. Order by OTS number.

"Dynamics in the Numerical Counts and the Contemporary State of the Chum and Pink Salmon Stocks in the Amur River Basin," by I. B. Birman, article, Trudy Soveshchaniya po Voprosam Lososevogo Khoziaistva Dal'nego Vostoka, no. 4, 1953, pp. 22-37. OTS 60-51041.

"Our Curiosity on the Operation of the Trawl in Water," by N. A. Lyapin, article, Rybnoe Khoziaistvo, vol. 2, no. 35, pp. 43-46. OTS 60-51080.

"The State of Stocks and Means for Increasing the Number of Amur Pink Salmon," by V. V. Abramov, article, Trudy Soveshchaniya po Voprosam Lososevogo Khoziaistva Dal'nego Vostoka, no. 4, 1953, pp. 48-69. OTS 60-21144.

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"Studies of Crustacea of the Red Sea. Part I--Podophthalmata and Edriophthalmata. XIV," by O. Paul'son (Otto Mikhailovich), 180 pp. Tipografica S. V. Kul'zhenko, Kiev, U.S.S.R. OTS 60-21821.

"Ways of Increasing the Reproduction of Amur Chum Salmon," by V. Ia. Levanidov, article, Trudy Soveshchaniya po Voprosam Lososevogo Khozjalstva Dal'nego Vostoka, no. 4, 1953, pp. 120-128. OTS 60-51042.

Kholodil'naia Tekhnika (Refrigeration Journal) no. 5, 1960, 80 pp., illus., printed in Russian with English summaries. Kholodil'naia Tekhnika, c/o Four Continent Book Corp., 822 Broadway, New York 3, N.Y. Includes, among many others, articles on: "Precooked Frozen Foods," by V. Shelaputin and others; and "Experimental Storage of Fatty Fish at Low Temperatures," by A. Piskarev, L. Lukyanitsa, and K. Pomicheva.

#### VENEZUELA:

Conservas de Pescado (Canned Fishery Products), Serie Estudios Preliminares sobre Industrias No. 1, 24 pp., printed in Spanish. Corporacion Venezolana

de Fomento, Sub-Gerencia de Servicios Tecnicos, Unidad de Estudios, Caracas, Venezuela, 1960.

#### WHALE MEAT MEAL:

"Composition and Amino-Acid Content of High-Grade Whale Meat Meal," by H. Pritchard and Patricia A. Smith, article, Journal of the Science of Food and Agriculture, vol. 11, May 1960, pp. 249-252, printed. Journal of the Science of Food and Agriculture, Society of Chemical Industry, 14 Belgrave Square, London, S.W. 1, England.

#### WHALING:

"Aspects Actuels de la Peche a la Baleine: les Whales Catchers Japonais" (Contemporary Observations of Whaling: the Japanese Catcher Boats), by R. Lenier, article, France Peche, vol. 5, no. 44, October 1960, pp. 22-28, illus., printed in French. France Peche, Tour Sud-Est, Rue de Guemene, Lorient, France.

#### YUGOSLAVIA:

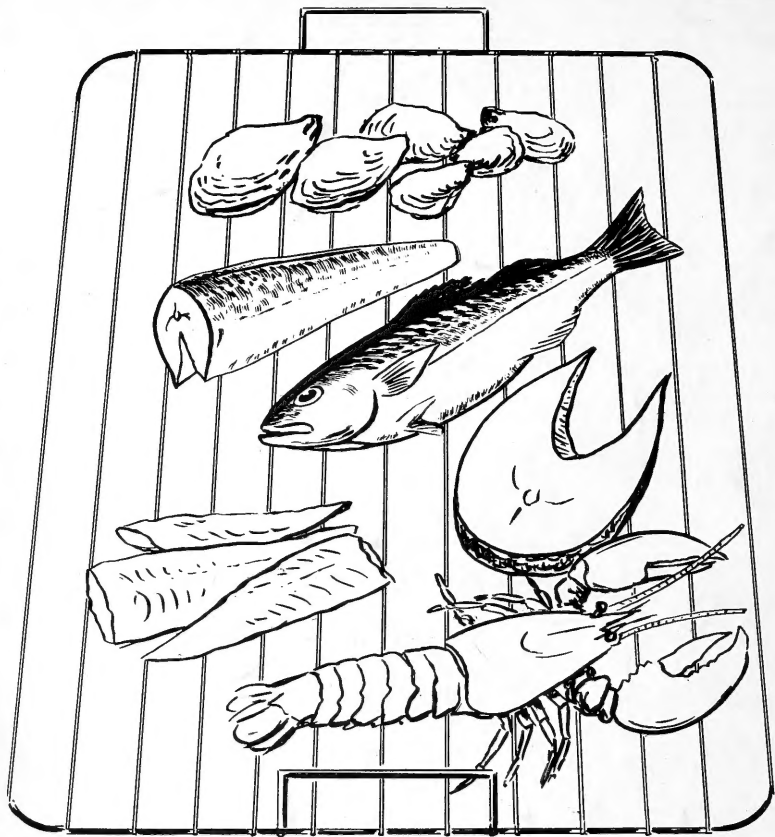
Stocarstvo i Ribarstvo, 1959 (Stockbreeding and Fisheries, 1959), Statisticki Bilten 182, 36 pp., illus., printed in Serbo-Croatian. Federativna Narodna Republika Jugoslavija, Savezni Zavod za Statistiku, Belgrade, Yugoslavia, November 1960.



#### CORRECTION

This correction should be made for the article "Down with Rejects--Up With Profits," which appeared in the December 1960 issue of Commercial Fisheries Review. The scale at the bottom of Fig. 1 on page 16 should have had the following legend: "Pounds rejected per thousand pounds of plant output."





# **FISH**

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taste treats.