International

FOOD AND AGRICULTURE ORGANIZATION

ATOMIC ENERGY AS POWER FOR FISHING VESSELS PREDICTED: A naval architect of the Food and Agriculture Organization (FAO) has predicted that fishing vessels powered by atomic energy will be in use "before many years have passed." He also said that the fishing boat of 1957 will possess many features which today are still in the idea stage.

The FAO Naval architect is secretary of the Second World Fishing Boat Congress, which is scheduled to be held in Rome in April 1959. He is arranging for the scientific papers on investigations and research which will be presented at the Congress. It is expected that naval architects, boatbuilders and designers, marine engineers, boat owners, skippers and fishermen, as well as government representatives from all the leading fishing countries will attend.

"Developments in fisheries are rapid these days," the Naval architect said. "When we had held our First International Fishing Boat Congress in 1953, we had a paper on gas turbines for fishing boats and several papers about factoryship design. Many participants thought we were too far ahead of practical possibilities, but today there are gas-turbine trawlers and dozens of huge factoryships operating, some in waters not before known to the fishing industry.

"Today, all kinds of interesting possibilities come to mind. There are advances in stern trawling, the use of stabilizers, and progress in automation. Why, it may not be many years before big factoryships can be sent to sea with a skeleton crew and have the main working crew join them by supersonic airplanes when needed.

"I venture to predict," he said, "that atomic-powered fishing vessels will be sailing the seas before many years have passed."

The 1953 Congress concentrated on design and construction. According to FAO, next year's Congress will take performance for its theme, and sessions will deal with fishing tactics, construction of vessels, sea behavior of boats, and productivity of vessels. The aim will be to gather from papers and discussions much practical design data; cost particulars and operational experience which will provide designers with information for building more efficient fishing boats.

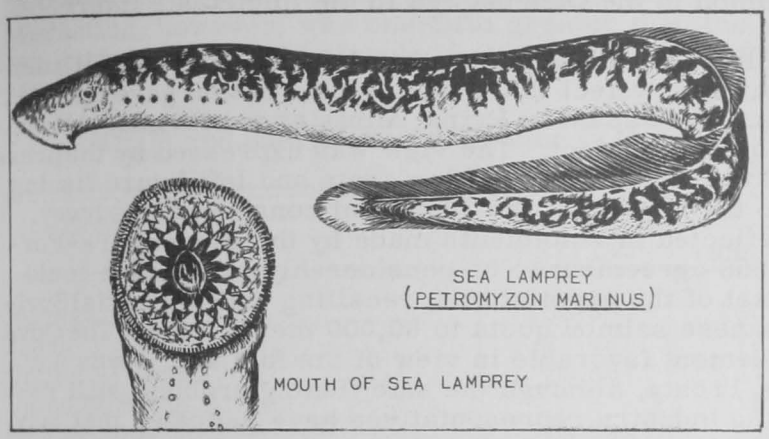
GREAT LAKES FISHERY COMMISSION

MEETING HELD IN WASHINGTON, D. C.: The Great Lakes Fishery Commission, established by treaty between the United States and Canada, met in Washington, D. C., April 9-10, 1958. The principal function of the Commission is the eradication of the sea lamprey predator which has so effectively destroyed most of the valuable food fishes of the upper Great Lakes.

Chairman of the Commission is L. P. Voigt, Conservation Director of the State of Wisconsin. Other United States members are Claude VerDuin, Mayor of Grand

Haven, Mich., and Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries.

The Canadian Commissioners are: A. L. Pritchard, Director of the Conservation and Development Service of the Department of Fisheries, Ottawa; A. O. Blackhurst, Manager of the Ontario Council of Commercial Fisheries, Port Dover, Ontario; and W. J. K. Harkness, Chief of the Division of Fish and Wildlife of the Ontario Department of Lands and Forests, Toronto.



On hand to report progress and plans on behalf of the two Government agencies which are conducting the Commission's program were Dr. W. A. Kennedy of Canada and Dr. J. W. Moffett of the United States Fish and Wildlife Service. They were accompanied by top members of their scientific staffs.

State conservation agencies were represented by Dr. Albert Hazzard of Pennsylvania, Dr. Mason Lawrence of New York, and Lee Roach of Ohio.

The principal method used to control the lamprey is the blocking of streams tributary to the Lakes. The lampreys are killed by electrical weirs on their upstream migration to spawning grounds. Another method has been the subject of experimentation, and very hopeful results are being obtained. This is the introduction into the streams of selective toxicants which kill the lampreys and their larvae but do not harm fish or leave a poisonous residue dangerous to human or animal life. Perfecting of this system will speed the work of lamprey control and bring nearer the time of rehabilitation of the lake trout and other commercial and sports fisheries.

INTERNATIONAL PACIFIC HALIBUT COMMISSION

CANADA APPROVES REVISED REGULATIONS: The Canadian Department of External Affairs has informed the U. S. Department of State that the Canadian Government in Order in Council No. P. C. 1958-446, March 29, 1958, has approved and enacted the revised Pacific Halibut Regulations drawn up by the International Pacific Halibut Commission in January 1958.

INTERNATIONAL WHALING COMMISSION

CONVENTION AMENDMENT RATIFIED BY FRANCE: The protocol amending the International Whaling Convention of 1946, done in Washington on November 19, 1956, has been ratified by France. Ratification was deposited on April 14, 1958, the U. S. State Department announced on May 5, 1958. The Protocol will not be in force until the required number of member countries complete ratification.

JAPAN-RUSSIA FISHERIES NEGOTIATIONS FOR 1958

JAPAN AND RUSSIA SIGN AGREEMENT ON SALMON QUOTA: The Japan-Soviet Fisheries Agreement for the 1958 North Pacific salmon season was signed on April 22, 1958, after more than three months of negotiations. The following are the salient features of the agreement: (1) the total salmon quota will be 110,000 metric tons; (2) Japan will be permitted to operate one fishing fleet in the Okhotsk

Sea with a total catch limit of 6,500 metric tons which will form part of the 110,000 quota; and (3) Japan and the U. S. S. R. have agreed to refrain from engaging in high-seas salmon fishing in the Okhotsk Sea beginning on January 1, 1959. The press has reported that the two countries have agreed to conduct a joint conservation survey in the Okhotsk Sea during 1958. Even if undertaken, the survey will not provide Japan with the right to fish for salmon in the Okhotsk Sea in the immediate future.

The press has been generally critical of the fact that Japan agreed to halt salmon fishing in the Okhotsk Sea stating in effect that Japan by this action gave up the principle of freedom of the seas. The Japanese Prime Minister vehemently denied this charge in Diet questioning on this subject. The view was expressed by the press that Japan should have accepted the 100,000-metric ton quota and left future fishing operations in the Okhotsk Sea to the results of the 1958 joint conservation survey. The Government of Japan, as reflected in statements made by the Agriculture-Forestry Ministry, considers the 1958 agreement to be considerably better than could have been anticipated at the outset of the negotiations, recalling that the initial Soviet proposal was to limit the Japanese salmon quota to 80,000 metric tons. The Government also considers the agreement favorable in view of the fact that it was not tied to the question of the Peace Treaty, although the safe fishing problem still remains unsolved. Japanese fishing industry representatives have indicated that they are reasonably satisfied with the new quota even though they, of course, would have liked to have obtained a quota closer to the 145,000 metric tons initially requested by Japan in the negotiations.

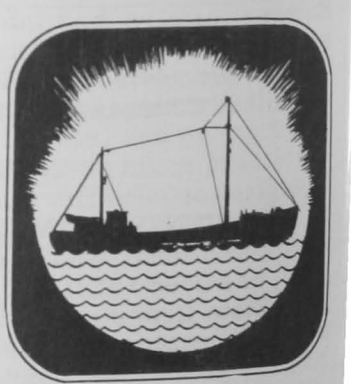
NORTHWEST ATLANTIC FISHERIES COMMISSION

ANNUAL MEETING FOR 1958 ANNOUNCED: The 1958 Annual Meeting of the International Commission for the Northwest Atlantic Fisheries was scheduled to convene at Dalhouse University, Halifax, Nova Scotia, Canada, in the week beginning June 9.

Commissioners, advisers, and experts from the 11 member countries will participate in the meeting. (Northwest Atlantic Fisheries Commission Newsletter No. 27, dated March 14, 1958.)

* * * * *

REGULATIONS OF THE TRAWL FISHERIES FOR COD AND HADDOCK EFFECTIVE: Following a circular note of November 15, 1957, from the Depositary Government (United States), the International Commission for the Northwest Atlantic Fisheries (ICNAF) proposals of 1955 for regulation of the trawl fisheries for for cod and haddock in Subareas 3, 4, and 5 became effective as from January 1958.



The 1957 amendment to the regulations providing special rules for the use of cover for the protection of the cod end is being considered by the Governments concerned. The Governments of France and Norway have informed the Depositary Government of their acceptance of the amendments.

In March-April 1957 a French expert visited Canada and the United States and participated in cruises with commercial fishing and research vessels for studying fishing methods, especially the means in use of protecting the trawl during hauling.

WHALING

ANTARCTIC WHALE-OIL OUTPUT DOWN SLIGHTLY BUT SPERM-OIL OUTPUT UP: Whale-oil production in the Antarctic during the 1957/58 pelagic whaling season declined slightly from a year earlier, according to preliminary data released by the International Whaling Commission, Sandefjord, Norway. Antarctic sperm-oil production, however, was one-fifth greater than the year before. The Antarctic season, ended at midnight March 16, 1958, and lasted 69 days, as did the season of a year ago.

Whale and Sperm Oil Production in Antarctic of Floating Factories, by Country, 1956/57 and 1957/58

Country	Whale Oil		Sperm Oil	
	1957/58 1/	1956/57 2/	1957/58 1/	1956/57 2/
	(Short Tons)			
Norway	136,067	160,496	22,696	18,293
Japan	97,451	78,380	20,157	13,886
United Kingdom	53,857	57,065	6,780	5,335
Union of South Africa 3/	-	15,411	-	750
Netherlands	19,382	16,359	2,362	1,223
Soviet Union	33,551	24,476	n.a.	1,226
Total	340,308	352,187	4/ 51,995	40,713

1/PRELIMINARY.
2/REVISED.
3/PRODUCTION OF ABRAHAM LARSEN INCLUDED WITH JAPAN IN 1957/58.
4/EXCLUDES SPERM-OIL PRODUCTION BY U.S.S.R.

The major Antarctic producer, Norway--with 9 floating factories--had a decline of almost one-sixth in whale-oil production, but output of sperm oil was one-fifth above that of 1956/57. Japan, operating 6 floating factories (in 1957/58 it acquired the former Abraham Larsen, which operated under the flag of the Union of South Africa in 1956/57), sharply increased both its whale-oil and sperm-oil production.

The United Kingdom, with 3 floating factories, had a slight decline in whale-oil outturn and an increase in sperm-oil output. Although the U. S. S. R. had only one floating factory in 1957/58, 6 catcher boats were added, to bring the total to 24 catchers--almost twice the number used by any other floating factory. Thus, the Soviet Union's whale-oil production was up sharply from last year. The Netherlands' single floating factory increased its whale-oil output 15 percent from last season, and its sperm-oil production was almost double that of 1956/57.

Aden

COMMERCIAL FISHERIES IN EASTERN ADEN PROTECTORATE STUDIED: A British fisheries officer was assigned to the Eastern Aden Protectorate in July 1956, for the purpose of developing the fisheries along the 450-mile coastline which extends from the Western Aden Protectorate to the Sultanate of Muscat and Oman. After operating for a year and a half on a very limited budget (the original four-year project had been allocated £28,000 (US$78,873) from the British Colonial Development and Welfare Fund), in 1957 the Fisheries Officer received from the Ruler of the Qa'iti Sultanate, the most important state in the Eastern Aden Protectorate, a contribution of £18,000 (US$50,704) for the project.

This sum of money enabled the Fisheries Officer to alter the ex-Scottish herring drifter with which he was provided, so as to make the boat more suitable for fishing in Aden waters. He has patterned the boat as much as possible along the lines of a purse seiner used in the United States. With this arrangement, and with some new nylon and kuralon nets from Japan (three floating gill nets of ½-inch mesh tied together), the Fisheries Officer recently made his first large catch--a haul of 5 tons of sardines (Sardinella longiceps). His technique was to set the gill net in a large semicircle around the school, and then run the boat across the mouth of the loop. Having caught almost the entire school, he let the net down for ½

hour and was astonished to find that in this short time two smaller schools of sardines had entered the net as well. When the net was hauled aboard nearly every mesh was filled (figs. 1 and 2).

Though this was his first commercially-profitable catch, the Fisheries Officer made other catches

FIG. 1 - A LARGE HAUL OF SARDINES IN A GILL NET BEING HAULED ABOARD THE VESSEL USED BY A BRITISH FISHERIES OFFICER IN EXPLORING THE FISHERIES OF THE EASTERN ADEN PROTECTORATE.

along the coast with various nets inherited from the Aden Colony Fisheries Department. His cotton kingfish net catches consisted primarily of small shark, which brings a very high price for drying in Aden. It was found that the trammel net brought up an assortment of sea life that considerably shortened the life of the net: sea-turtles, manta rays, crabs, crayfish, a mass of Murex shells, as well as small sharks, sole, rock cod, and other bottom feeders.

For commercial purposes, however, the Fisheries Officer intends to concentrate on surface netting, states an April 5, 1958 dispatch from the United States Consulate in Aden. There is little doubt in his mind that the surface fishing in southern Arabian waters is among the richest to be found anywhere in the world. In attempting to establish commercial fisheries which can be handed over to local management, the Fisheries Officer plans to exploit inshore surface fishing first, being confident that new grounds will not have to be sought for many years. This type of fishing is, moreover, more suitable to the type of native fishing craft being used along this coast.

A ready market exists for dried sardines in the hinterland of the Protectorate coast, both as a feed for livestock and as fertilizer for tobacco crops. The present system of preserving the fish, the simple and inexpensive method of letting them dry in the sun and lacing them with salt, would be quite adequate for even the exportation of large fish, providing the fishermen could be persuaded to use clean salt and to gut their fish thoroughly. Training the fishermen in modern methods is, of course, at least one half of the Fisheries Officer's job. He finds that there are considerable obstacles to introducing new practices and equipment. In many localities the fishermen are the most conservative element in society and observe a ritual of arbitrary restrictions on their trade which have deep roots in religion and superstition. In some towns there are rules prohibiting the use of nets, or, variously, of different baits--live bait or dead bait, lures, or crabs. Sometimes night fishing is prohibited. These "rules of the sea" are legislated and enforced by the headmen of the fishing community in each town. Violators are tried by the headmen themselves in their own fisheries courts, and their rule is final.

FIG. 2 - A BOATLOAD OF SARDINES CAUGHT WITH GILL NETS.

Some areas have proved to be more conservative than others; it is often the smaller towns and villages, especially those that depend for their main livelihood on fishing, that have the greatest urge to improve their techniques and equipment. Qusa'ir, a small town near the Mahra Coast, is an example of the progressive and adventurous spirit that one occasionally finds. Each year the Qusa'iris send a fleet of shark fishing "sambuks" as far afield as Socotra, and they are the only ship builders along the coast--save the Adenis themselves--who build boats with bolted instead of sewn seams. Towns such as Qusa'ir are naturally only too happy to substitute nylon for cotton nets; in some cases cotton itself replaced cheap Indian jute fibres as recent as 20 years ago.

It is a fairly accurate generalization to say that while the bigger towns are conservative in temper, the smaller ones wish to go ahead. Unfortunately it is the first who have the money to change over, and the second who do not. The Fisheries Officer's successes in the smaller towns can never pay off until (and this is his plan) he has organized a viable industry in a large town where the big merchants will have an interest in the venture. Once established as a profitable enterprise, modern commercial fishing would probably expand as merchants go to other points along the coast to set up rival ventures. Only by the artificial system of extending substantial loans to individual indigent fishermen could modern gear be introduced initially in the small fishing towns.

Brazil

FROZEN TUNA MARKETED BY JAPANESE-SPONSORED FIRM: The Price and Supply Commission of the State of Pernambuco, Brazil, announced that 640 metric tons of fish were made available to Recife and other parts of Pernambuco during Holy Week (March 30-April 15), according to a dispatch from the U. S. consulate at Recife, dated April 7, 1958. A Japanese-sponsored Brazilian firm supplied 560 tons of frozen albacore tuna, which was sold at the standard retail price of Cr$30 per kilo (about 14 U. S. cents per pound). The traditional native "jangada" fleet supplied 80 tons of fish to Recife at retail prices ranging from Cr$70 per kilo (about 33 U. S. cents per pound) for dressed high-quality fish to Cr$30 per kilo (about 14 U. S. cents per pound) for round inferior-quality fish.

The Brazilian-Japanese firm sells frozen tuna to wholesalers at Cr$23 per kilo (about 11 U. S. cents per pound). The firm supplied tuna to other coastal cities of Brazil as follows: Rio de Janeiro, 60 tons; Salvador, 200 tons; Maceio, 50 tons; Natal, 50 tons; Joao Pesso, 30 tons; and Fortaleza, 140 tons. It is reported that profits have been large enough to stimulate the interest of other private firms to establish modern fishing fleets of their own. It is believed that the "jangada" fishermen, which may be forced out of business as a result of their relatively small catches and the price competition, will be trained to work as crews of modern fishing vessels.

In all probability, Brazil's booming tuna industry should provide high food value protein to the low-income groups of the Northeast at reasonable prices. If expansion in the industry continues, Brazil may export tuna in quantity within a few years.
NOTE: BRAZILIAN CRUZEIROS CONVERTED AT RATE OF CR$97.50 EQUAL US$1.

* * * * *

RETAIL PRICE FOR ALBACORE SET BY STATE COMMISSION: The Pernambuco State Supply and Price Commission has set the retail price of albacore tuna at Cr$30 per kilo (about 14 U. S. cents a pound) after considerable discussion. Representatives on the Commission from local industrial unions and the army wanted the price set at Cr$23 (about 11 U. S. cents a pound). It is estimated that the Japanese-sponsored fishing firm could make a profit at Cr$23 per kilo if they were guaranteed a market for capacity production.

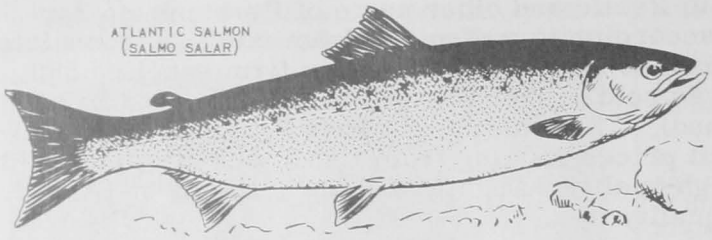
The native Brazilian fishermen are reported to charge Cr$60-80 per kilo (28 to 37 U. S. cents a pound) for their catches. These fishermen would be hard hit in trying to compete with the Japanese-sponsored firm except for the fact that the consumer looks on albacore as a "poor man's" food. The Japanese firm at present has caught and marketed tuna only, but may later attempt to market whale meat. A small whaling firm at Joao Pesson, Paraiba, has been purchased by the Japanese-sponsored firm, the United States Consulate at Pernambuco reports in March.
NOTE: CRUZEIROS CONVERTED AT RATE OF CR$97.50 EQUAL US$1.

Canada

ATLANTIC SALMON MEETING: Specific recommendations for the improvement of Canada's Atlantic salmon stocks in the Maritime Provinces, Quebec, and Newfoundland were made at the annual meeting of the Federal-Provincial Co-ordinating Committee on Atlantic Salmon, held in Ottawa, February 11-12, 1958.

The suggestions made dealt with regulations as to netting, open seasons, control of poaching in certain areas, the stocking of streams from salmon hatcheries,

and mitigation of the damage done to salmon populations by the spraying of forests with DDT in efforts to wipe out the spruce budworm. In this connection, the Co-ordinating Committee reported that a search was being made for an insecticide other than DDT which would not harm fish.



Problems involved in efforts not only to halt the decline but to increase the Atlantic salmon populations were particularly complex because of the marked susceptibility of this species to even the slightest changes in its fresh-water environment, the Canadian Minister of Fisheries said. Frequently these changes were so subtle as not to be noticeable to the untrained eye but the effects were nevertheless drastic.

The Minister cited the case of several European countries which had at one time enjoyed large populations of salmon but had seen them become seriously depleted. Much of this depletion was attributable to the impact of spreading civilization on the inland waterways in which the salmon are hatched and nurtured in the years until they go to sea. (Canadian Trade News, February 1958.)

* * * * *

CONSUMPTION OF FISHERY PRODUCTS, 1955 AND 1956: During 1956, the per capita consumption of fishery products in Canada amounted to 13.4 pounds (edible weight), a slight decrease as compared with 13.6 pounds in 1955, according to a recent statement of the Agriculture Division of Canada's Dominion Bureau of Statistics.

Canadian Annual Per Capita Consumption of Fishery Products, 1955-56

Group	1956	1955
	. . (Lbs.) . .	
Fresh or frozen fish and shellfish . .	7.2	7.3
Cured, salted or pickled fish.	1.7	1.8
Canned fish and shellfish	4.5	4.5
Total	13.4	13.6

* * * * *

CONTAINERS OF SHELLFISH MEATS MUST BE LABELED WITH NET WEIGHT: The Canadian Government on January 31, 1958, circulated a Directive to their personnel advising that henceforth all shucked shellfish must be labeled in terms of net weight. The part of the Directive from the Canadian Director of Inspection and Consumer Service states:

"7. Containers of shucked shellfish meats must be labeled in terms of net weight, as required by section 9 of the Fish Inspection Act. For example, a tin of shucked oysters must be marked _____ pounds net weight. However, the packer at his discretion may add the equivalent fluid measure designation properly identified as being either Imperial or U. S. measure."

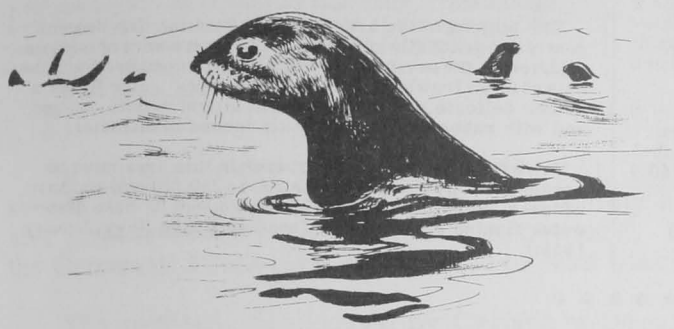
The directive designates that the container must bear the name of the country of origin.

* * * * *

FUR-SEAL INVESTIGATION IN NORTH PACIFIC: The first Canadian group to begin research work on North Pacific fur seals left Nanaimo, British Columbia, on February 13 for a three-week cruise of waters offshore from Barkley Sound. This cruise initiated a program which calls for a Canadian catch quota of from 500 to 750 fur seals for scientific studies during 1958.

The quota was set by the new North Pacific Fur Seal Commission, which is made up of representatives of the United States, Canada, the U. S. S. R., and Japan, and which held its first annual meeting in Washington in January 1958.

The North Pacific Fur Seal Convention prohibits pelagic sealing and also provides for scientific investigation of the migratory movements of the seal herds, their wintering areas, and feeding habits. The commercial catch of fur seals is made each breeding season on the Pribilof Islands in the Bering Sea, and is strictly controlled. The Pribilofs are in United States territory. Smaller catches are made on the Commander and Robben Islands on the Asiatic side of the North Pacific.



FUR SEAL SWIMMING.

The Canadian research group is made up of members of the staff of the Fisheries Research Board of Canada from the Board's Biological Station at Nanaimo. They will take their limited catch on the surface of the ocean, a form of sealing prohibited to any but authorized scientific investigators and Indians, Aleuts, Eskimos, and Ainos. The animals taken will be skinned and the contents of their stomachs examined. Pelts will be shipped to a fur-manufacturing firm for processing.

British Columbia fishermen, operating in coastal waters, have occasionally shot young fur seals under the impression that the animals were hair seals, thus risking heavy penalties. The method of distinguishing between the two species is by observing their manner of swimming. Hair seals swim only with the top of the head showing above water. Fur seals are in the habit of raising head and shoulders vertically out of the water and will frequently swim on their backs with flippers showing. (Canadian Trade News, February 1958.)

* * * * *

NEW TYPE HEADLINE ROPE DEVELOPED FOR MIDWATER TRAWLS: The headline ropes used in midwater trawl nets should be strong, light, relatively thin, and flexible. In these nets the headline completely encircles the mouth opening, whereas in bottom trawls the headline is referred to as the top rope to which the floats are attached. These ropes should be so constructed that they will not shrink or retain permanent twists after repeated immersion in water. To meet these requirements the Canadian Nanaimo Biological Station in British Colombia developed a headline which was constructed from preformed alternate-lay galvanized wire rope, sheathed with braided spun nylon rope.

In the first midwater trawls developed at the Biological Station the headlines were constructed from manila-clad wire rope (beiflex cable) to withstand the heavy strains imposed while towing. This type of headline rope was not extremely satisfactory because after immersion in the water only a few times, it twisted and pulled the netting in the wings and body out of shape. Most of the twisting was eliminated by use in the headline of shorter lengths of beiflex cable joined together by galvanized thimbles to a metal ring, at the points where the base of the wing corners were attached to the body. However, the alternate stretching and shrinking of the rope and the gradual weakening of the wire cores caused by the corrosive action of the salt water could not be overcome.

The new type of nylon-sheathed headline was constructed of 1-inch diameter 6x9 (12-6-1) galvanized preformed alternate right and left lay wire rope clad with a braided spun nylon sheath. Braided spun nylon was chosen for the sheathing to eliminate slippage of the knots in hanging the netting to the headline. The sheathing was marked with a continuous red line to assist in preventing twists and turns being placed in the rope when hanging the netting to the headline.

Although the cost of the new experimental headline was about three times that of the combination manila-clad wire rope, production on a commercial scale would undoubtedly reduce the price to an amount comparable with that for other ropes. This headline construction proved to be very satisfactory in the midwater trawl and ocean perch nets tested during experimental operations during the summer of 1957. The headlines remained flexible and no twists, kinks, or signs of shrinkage were observed in the ropes during the three months of experimental fishing. This rope was as easy to handle as other types of headline ropes. The rope could be spliced readily by paring the nylon sheathing away from the steel cable at the required place and afterwards covering the area again with a synthetic tape. The increase in the breaking strength and longer life of the new rope were important factors which would warrant its use in trawl nets.

* * * * *

OCEAN PERCH DEEP-WATER EXPLORATIONS IN WEST ATLANTIC NORTH OF FLEMISH CAP: Exploratory fishing for ocean perch in the western Atlantic Ocean area north of Flemish Cap (a small fishing bank about 250-300 miles east of Newfoundland) by Canadian scientists of the Fisheries Research Board's Biological Station in St. John's, Newfoundland, was carried out by the station's M/V Investigator II. Depths between 100 and 396 fathoms were explored.

Ocean perch were absent in the trawl sets at 100 to 108 and 386 to 396 fathoms and scarce at 150 and 350 fathoms. They were most abundant at 250 fathoms where each of three sets produced a good catch. At depths of both 200 and 300 fathoms 1 set out of 3 gave good results.

In view of the small size of the net (a No. $\frac{3}{4}$ - 35 otter trawl with a 39-foot headrope and a 50-foot footrope), the short towing period of only a half hour per set, and the probable inefficiency of single-wire fishing, the catches at 250 fathoms were suitable for commercial exploitation.

As regards size, the proportion of small (less than 10 inches long) ocean perch present decreased from the shallowest to the greatest depths. Below 150 fathoms, apart from a small decrease at 250 fathoms, ocean perch average sizes increased with increasing depth.

Neglecting the very small proportion of the fish less than 10 inches long, the catches were indicative of excellent suitability in the 200- to 300- fathom range where, considering the very small net used, there should be large ocean perch catches ranging upward to 10,000 pounds or more per hour's tow for the larger commercial draggers.

The bottom in the area north of Flemish Cap deepens gently and gradually and is smooth. There were no serious injuries to the net in 20 drags, although compared with the nets of large trawlers, the net of the Investigator II was a rather delicate one of cotton with a light manila cod end and with rubber rollers only six inches in diameter.

Trawlers fishing for ocean perch in this area must be prepared to drag as deeply as 200 to 250 fathoms and have winches operating at a fast enough speed to make deep-water fishing profitable. (Canadian Trade News, January 1958.)

* * * * *

REFRIGERATED SEA WATER USE TESTED IN NORTH PACIFIC HALIBUT FISHERY: The use of refrigerated sea water to preserve halibut in the North Pacific Ocean fishery has been investigated by the Fisheries Research Board of Canada. Refrigerated sea water fish holding proved successful in the Board's earlier experiments on a salmon packer, and it was decided to apply a test to halibut fishing since the long holding time, required because of the length of a trip, dictated some improvement in holding methods. A halibut trip may consist of 12 days average fishing time plus 1 to 5 days returning to port, plus 1 to 5 days in port prior to unloading.

The vessel selected for the experiment was the Silver Viking, which was being built for private ownership, thus making possible the incorporation of the system into her original construction. Since this vessel was designed as a combination salmon seiner and halibut long-liner, it also made possible a study of the application of refrigerated sea-water holding to salmon seining. The vessel is a typical Pacific salmon seiner of wood construction, 78 feet long with a 22-foot beam. Six tanks were installed in her hold, three on either side of the shaft. The tanks were constructed of 3/16-inch steel plate and surfaces unsupported by the hold lining were stiffened by 2-1/2-inch angle irons toe-welded at two-foot centers. The inside surfaces were coated with an Epoxy resin coating to resist erosion. Two inches of cork insulation were applied to the external surfaces.

Cooling coils, located in each tank, were made up of 250 feet of 3/4-inch O.D. steel tubing, the assembled coil being hot-dip galvanized. The coils were contained in closed compartments along the inboard tank sides. Circulation of the chilled sea water was provided through this compartment by a separate circulating pump for each tank. Refrigeration to these coils was supplied by two compressors (one for the three port tanks and one for the three starboard tanks).

To augment this refrigeration system there was a completely separate one comprising a shell and tube chiller, circulating pump, and refrigerant compressor. This system was used to speed up the initial cooling of any one tank but also served as a standby system in event of failure of the tank coil system.

All pumps and compressors were electrically driven. Power was supplied by two Diesel-driven alternating-current generators. These generators were of the 120- to 208-volt type which supplied either single phase 120-volt current for the small motors and ship lighting or 208-volt three-phase power for the larger motors.

The Silver Viking engaged in salmon seining in July and August of 1956. Round sockeye and chum salmon were brought to port in excellent condition after the week's fishing, and sockeye, after further sea-water storage to a total holding time of 14 days, was still judged to be excellent. Some difficulty was encountered with the loss of scales and skin pigment of round coho and jack king salmon. The dressing of all fish of these species overcame this trouble whereas the dressing of sample individuals did not. These observations gave support to a theory that the damage was caused by a destructive enzyme disgorged with the stomach contents of these actively-feeding fish. Belief that this loss of scale and skin pigments was caused by the motion of fish in the tanks seems unlikely since this did not occur in loads composed entirely of nonfeeding fish or dressed fish.

The use of this equipment in salmon seining showed many advantages which may in the future be of value. First was the ship's ability to operate in areas remote from canneries or packers. Second was that no time was lost in the daily delivery of fish. Third was the much increased value of some types of fish when delivered by the fishing vessel itself directly to the port. This was emphasized by a week's catch of chum salmon which was delivered to the fresh fish market. The tank trunks on deck hindered the crew during salmon-seining operations while handling the net and brailing fish aboard. However, simple alterations were made which eliminated this difficulty.

The vessel engaged in halibut fishing in the December 1957 opening of halibut in Area 2. Some 36,000 pounds were caught and sold 8 to 15 days after catching. These fish were in fine marketable condition, and samples held in a tank at the Vancouver Technological Station to a total time of 29 days were still in good condition. Many advantages were demonstrated by this trip. Foremost was that halibut could be held beyond any period practical in fishing. Elimination of icing of fish increased the effectiveness of the crew, which would mean larger catches in periods of good fishing. The equipment in no way appeared to hinder the handling of gear or fish.

Of special interest to this project was the chiller which, as explained previously, was designed to assist in the initial cooling of the sea water and to a limited extent to act as an emergency system. However, since the first purpose was of great importance, the chiller was designed with a close tube spacing permitting high water velocity and hence a high heat transfer from the tubes. Thus a chiller of small outside dimensions which could be easily installed or dismantled for maintenance could be made. It was expected that this design would not permit attaining low temperatures, because of ice formation on the tubes. This, however, was not the case as it has been proven possible to cool water to 30° F. with the chiller.

The chiller had an outer shell of six-inch Kralastic pipe. The use of this material served three purposes: it reduced the weight of the chiller, eliminated corrosion of the shell, and provided sufficient elasticity to prevent rupture by freeze-up. The shell contained 240 feet of 5/8-inch O.D. copper refrigerant tubing arranged for dry refrigerant

expansion in six parallel circuits of four horizontal runs of tubing extending the length of the shell. Twenty semicircular baffles direct the flow of sea water across the tubes. All refrigerant connections were on one end to permit easy removal of the shell for maintenance.

The success of this chiller altered the writers' opinions on design of refrigerated seawater equipment. With such small chillers being effective they can be relied on entirely for cooling without employing tank coils. This change would in turn affect other components of the system. For example, on such an installation as the Silver Viking the same flexibility and guarantee against failure could be obtained with two compressors and two chillers as would otherwise be afforded by three compressors. Similarly, two compressors could be driven mechanically, whereas a third compressor warrants electrical generating and driving. The removal of coils from the tanks would simplify maintenance and permit the use of cheaper corrosion-resistant coatings. (Since the above report was made the Fisheries Research Board purchased the Silver Viking for its biological work out of its Nanaimo Station. Some modifications will be necessary to facilitate the sort of investigations which will be assigned to the vessel. These modifications are well under way. Canadian Trade News, January 1958.)

* * * * *

RESEARCH ON THE USE OF METAL LOBSTER TRAPS: A new phase of research on the use of metal lobster traps may have far-reaching effects on the lobster fishery of Canada's Atlantic provinces. The new research was announced by the Canadian Fisheries Minister and was started early in March 1958.

The project, sponsored by Canada's Department of Fisheries through its Industrial Development Service, brings together in a concentrated 30-day program personnel of the Fisheries Research Board of Canada, the National Research Council, the Royal Canadian Navy, and the Department.

With the aid of professional divers, a diving chamber, underwater television, and movie cameras, the scientists, in conjunction with nontechnical members of the team, will invade the bottom-of-the-sea haunts of lobsters in the waters off Yarmouth, Nova Scotia.

The objective of the research, among other things, is to determine whether metal lobster traps are more economically practical than wooden traps in the catching of lobsters. Last year fishermen in the Maritimes, Quebec, and Newfoundland landed about 44 million pounds of lobsters which had a value to the fishermen of over US$14 million.

This phase gives observers a ringside seat from which they can observe the behavior of lobsters in their native habitat. Findings will not be reached for some time but they are expected to go a long way toward solving the problem of trap losses by storms.

The HMCS Greenwood, of the Royal Canadian Navy, based at Halifax, will take part in the project. This vessel's diving chamber will be submerged on the lobster grounds and underwater movie and television cameras will record the actions of the lobsters. Other technical equipment will also be used to measure the effects of vibrations, currents, etc. In addition to the Naval vessel, three boats of the Department of Fisheries will participate in the operation. They are the Limada, Modiolus II, and Serpurla.

During the past four years metal traps have been tested on the various fishing grounds. The original project involved the use of steel traps fishing against wooden traps. The continuing experiment will include not only the old-type steel traps with three fishing heads and the door opening on the top, but also new steel traps with three fishing heads, the trap opening from the bottom, and catch locks on the ends; aluminum traps with three fishing heads with catch locks hooking under the bottom; nylon rope and twine; aluminum floats; high purity zinc anodes to help curb erosion of the steel traps; aluminum and fibreglass lobster buoys.

Experience gained in four years of testing under varied conditions in various parts of the Maritimes has proven that metal traps stand up better under gale and sea conditions than do traps made of wood. Metal traps also outlast wooden traps

by many years. Metal-producing firms are cooperating by supplying some of the traps necessary for the experiments.

Trap losses through storm have been one of the main problems lobster fishermen have had to face. Although the Department of Fisheries had sponsored trap insurance, only a portion of lobster fishermen have taken advantage of this protection. As a result, a severe storm can bring great economic hardship to noninsured fishermen. Coupled with information already tabulated showing the number of lobsters caught in both metal and wooden traps, the undersea observations should fill in the missing parts of the picture. (Canadian Trade News, February 1948.)

* * * * *

SALT SUBSIDY FOR SALTED FISH PRODUCERS: It is the intention of the Canadian Government to continue in 1958 the policy of paying the Atlantic Coast producers of salted fish products a rebate of 50 percent of the cost of salt.

The Minister of Fisheries pointed out that fishermen producing these relatively low-priced products have been faced with controlled prices in many of the export markets and rising costs of production. The assistance has been paid for some years in the provinces of Newfoundland, Nova Scotia, New Brunswick, Prince Edward Island, and Quebec. The assistance does not apply to products sold in the United States. (Canadian Trade News, February 1958.)

* * * * *

STUDIES ON HOLDING LOBSTERS IN ARTIFICIAL SEA WATER: Studies on how temperature and crowding affect the holding of lobsters in artificial sea water were conducted at the Fisheries Research Board of Canada's Biological Station at St. Andrews, New Brunswick.

The discovery that lobsters can live in artificial sea water has aided in the recent growth of inland markets for live lobsters. Suitable artificial sea water is easily prepared by dissolving five readily-available salts in tap water. Many inland storage and display units that hold from 50 to 500 pounds of lobsters in artificial sea water are now in use and more are being built. Elaborate glass and stainless steel units with mechanical refrigeration, aeration, and filtration are manufactured. These are used primarily for display purposes.

If suitable water conditions are maintained in these units, the lobsters will remain active and form an attractive display for long periods. For practical reasons the volume of artificial sea water in inland holding units is limited and the lobsters are usually crowded. Under such conditions the waste products from the lobsters gradually accumulate and the water becomes murky and finally toxic. At this point the lobsters will weaken and die unless the water is replaced. The accumulation of toxic materials can be slowed down considerably and the appearance of the unit improved by filtering out the solid waste products as they are formed. However, even with efficient filtration the water eventually becomes toxic. If the water is not changed often enough unnecessary losses will occur. On the other hand too frequent changes mean a waste of time and money.

From general observations it was obvious that both the temperature of the water and the degree of crowding were important factors in determining how long the water would remain suitable. More precise information on the effects of these factors was obtained from the following experiments.

Fifty lobsters (total weight 50 pounds) were held in 50 (imperial) gallons of artificial sea water at each of four temperatures until all died. The water was not changed or filtered during the course of the experiment but was well aerated to provide an ample supply of dissolved oxygen. At 34° F. the lobsters lived an average of 26 days; at 43° F., 19 days; at 57° F., 10 days; and at 68° F., 6 days. These results show clearly that the lower the temperature the longer the water will remain suitable.

Twenty lobsters (20 pounds total weight) were held in five different amounts of artificial sea water ranging from 10 to 80 gallons. This provided five degrees of crowding as follows; 1/4, 1/2, 1, 1-1/2, and 2 pounds per gallon. The water temperature was maintained at 40° F. and the lobsters were held in the same unfiltered but well-aerated water until all died. At 1/4 lb. per gal. the lobsters lived an average of 73 days; at 1/2 lb. per gal., 53 days; at 1 lb. per gal., 33 days; at 1-1/2 lbs. per gal., 22 days; and at 2 lbs. per gal., 16 days. It is clear that the water remains suitable longer when the lobsters are less densely crowded--over four times as long at 1/4 lb. per gal. as at 2 lbs. per gal.

At temperatures near the freezing point lobsters are sluggish and unattractive for display, and refrigeration costs are higher. There is also the danger of killing lobsters at very low temperatures, especially during the summer when they have been accustomed to warm water. Lobsters can be held at moderately high temperatures but the water must be changed frequently. The best compromise for most holding purposes appears to be a temperature of 40° to 45° F.

Lobsters can be held at various degrees of crowding but the more they are crowded the more often the water must be changed. In general the less the crowding the easier it is to provide adequate aeration and filtration and the longer the water remains suitable. In deciding the crowding that is best for his particular purpose an operator must consider the space required, the cost and appearance of his holding unit, and the inconvenience and loss of time involved in frequent water changes.

In inland holding one of the operator's primary concerns is knowing when to change the water to avoid unnecessary losses. Some lobsters are, of course, injured or weakened in shipment and will die shortly after they are placed in a holding unit. Such losses can to a large extent be avoided if each shipment is examined carefully and the weak lobsters are processed quickly. From the daily records of deaths in the experiments reported here and other similar experiments, it is possible to estimate how long the water will remain suitable at various degrees of crowding. If vigorous lobsters are held at 40° F. in unfiltered artificial

sea water, there should be no serious losses if the water is changed as follows: every 10 days when crowded to the extent of 2 lbs. per gal.; every 2 weeks at 1-1/2 lbs. per gal.; every 3 weeks at 1 lb. per gal.; every 5 weeks at 1/2 lb. per gal.; and every 6 weeks at 1/4 lb. per gal. Lobsters that have become weak because of toxic waste products normally revive quickly when the water is changed. (Trade News, January 1958.)

Chile

NEW REGULATIONS FOR FOREIGN FISHING VESSELS PROPOSED: The Chilean Ministry of Agriculture has proposed a law regulating the granting of permits to foreign craft to fish in Chilean waters. The principal changes in existing regulations appear to be the following: (1) Permits are to be granted for a two-year period, whereas they were previously granted for one year. The decree states that renewal of this two-year permit may not be granted; (2) To qualify for issuance of such a permit, foreign craft must be not more than five years old, if of wood, and nor more than ten years old, if of other material. Furthermore, evidence that the vessel is of high-grade quality and construction must also be provided. This proposed law must be approved by the Ministries of Defense and Foreign Relations before being forwarded to the Comptroller General for final approval.

Colombia

LICENSE FEES FOR COMMERCIAL FISHING: Colombia Ministry of Agriculture Resolution 296 of March 10, 1958, establishes license fees and administrative procedures for obtaining licenses. The resolution was authorized by Article 16 (g) of the basic fishing regulation 0357, December 13, 1957, which gave the right to the Ministry of Agriculture to fix such fees and procedures.

The Resolution establishes these license fees:

(1) Individual commercial fishing license: 2 pesos (44 U.S. cents).

(2) Registration certificate for canoes, skiffs, or any small boats used in lake, river, or coastal fishing, that require two or more persons for operation: 15 pesos (US$3.33)--valid for 1 year and issued to the owner.

(3) Registration certificate for vessels, valid for 1 year, as follows (tonnages are gross, unless otherwise specified):
- (a) Vessels weighing up to 2 tons: free
- (b) Vessels weighing more than 2 tons but not more than 10 tons: 50 pesos (US$11.12)
- (c) Vessels weighing more than 10 tons do not have to purchase a registration certificate but must purchase a fishing permit.

(4) Fishing permits for marine commercial fishing, valid for 1 year, as follows:
- (a) Vessels of more than 10 tons but not over 25 tons: 200 pesos (US$44.46)
- (b) Vessels of more than 25 tons but not over 50 tons: 400 pesos (US$88.92)
- (c) Vessels weighing more than 50 tons: 600 pesos (US$133.38)

(5) Registration certificate for foreign vessels, which are not connected in any way with Colombian firms or interests, and which are devoted to the fishery of marine mammals, tuna and tunalike fish, or live bait, in Colombian waters: US$2.00--valid for 1 year.

(6) Special permit for the fishery of marine mammals, tuna, and tunalike fish, or live bait, for vessels which are not connected in any way with Colombian firms or interests: US$6 in the Pacific Ocean and US$8 in the Caribbean Sea per net ton of registered weight of vessel. These special permits are valid for 100 days.

Licenses and permits may be obtained from the Ministry of Agriculture offices except that special permits for the fishery of marine mammals, tuna and tunalike fish, or live bait, will be issued only by the Director of the Division of Natural Resources or by the Chief of the Fish, Fish Culture, and Game Section.

Cuba

COOKED TUNA LOINS SHIPPED TO THE UNITED STATES: Shipments of cooked tuna loins to the United States have been made by the joint Cuban-Japanese fishing company according to news sources in Cuba. The tuna industry is new in Cuba and total exports to date have not exceeded 400 tons, including 250 tons of cooked tuna loins. Stocks on hand and available for export consist of 200 tons. The Japanese fishing vessel Sumiyoshi Maru (used as a training ship for Cuban fishermen and also as a fishing vessel) was the source of the tuna exported to the United States and Puerto Rico.

It was also reported that other Japanese firms are interested in making similar lease arrangements with Cuban firms as exist between the one joint Canadian-Japanese fishing company and the Sumiyoshi Maru. But the Cuban National Fisheries Institute has adopted a firm decision not to permit any further arrangements of this type. However, the Institute may permit the employment of foreign technicians and crews if the vessels fly the Cuban flag or are owned by Cubans.

The Sumiyoshi Maru departed from Habana on March 29, 1958, with another group of Cuban fishermen trainees and some Government scientific personnel. The vessel will conduct exploration activities and studies on the north coast of Pinar del Rio, the Yucatan Channel, south of the Isle of Pines, south of the Grand Caiman Islands, and south of Cienfuegos. This will be the first exploratory trip in purely Cuban waters during which a search will be made for new sources of bluefin, yellowfin, and albacore tuna, swordfish, sailfish, and other species. A well-known Cuban naturalist is aboard the vessel as the official delegate of the National Fisheries Institute. The scientific personnel will debark at Cienfuegos after which the Japanese vessel will continue its commercial fishing operations in the Atlantic and the Caribbean, returning to Habana about June 10 (United States Embassy in Habana, dispatch dated April 14, 1958).

* * * * *

CLOSED SEASON FOR MOJARRAS AND SPONGES: The Cuban National Fisheries Institute imposed a closed season on the mojarra species of fish, including joturo, anguila, biajaca (tripletail), and dajao, effective April 1, 1958. The resolution putting into effect this closed season appeared in Official Gazette No. 53 of March 18, 1958, and will be in effect until cancelled by another resolution.

A closed season began on April 15, 1958, on the harvesting of sponges in the areas of the Western maritime zone, North of Caibarien, and South of Batabano, with the continuance of sponge fishing prohibited during the closed season off the coast North of Vuelta Abajo in the Province of Pinar del Rio. This closed season will also remain in effect until terminated by an appropriate resolution. The notice concerning this closed season appeared in the Official Gazette No. 65 of April 3, 1958. (U. S. Embassy in Habana dispatch, April 11, 1958.)

Denmark

METHOD OF COATING FROZEN FISH WITH HOT POLYETHYLENE: A method of packaging frozen fish which involves the manufacture of polyethylene as used (said to extend greatly the storage life of the product) has been patented in the United States. The patent was applied for by the chairman of the Danish Association of Producers of Flatfish, who is also president of a firm producing frozen and canned fish at Esbjerg, Denmark.

The new method works as follows: the frozen product passes on a conveyer belt from the freezer directly to a polyethylene extruder, which has a special exhauster that covers the product with a polyethylene film produced at the instant of wrapping. The product can continue on the same belt directly to the storage room.

Due to the great difference in temperature between the polyethylene film which is produced at a temperature of 180° C. (356° F.) and the frozen product which has a temperature of -30° C. (-22° F.), a difference of 210° C. (378° F.), the heat of the polyethylene has the effect of destroying a good deal of surface bacteria, without damaging the product, since this difference of temperature exists for only a brief part of a second. As the product is passed out of the extruder, the air is evacuated from the polyethylene tube which is heat sealed at both ends.

Because of the characteristics of polyethylene the object appears as a glazed polyethylene inclusion. It is reported that this has the same effect as perfect glazing without any risk that this seal can become diminished by the influence of air or freezing. In addition, there are the advantages inherent in having the product polyethylene-enclosed.

This method of packaging can cut down the investment tied up in a variety of sizes of packaging, according to the inventor. Instead, a considerably-reduced stock of the raw material, polyethylene powder, may be kept, which has the advantage of being 100 percent usable regardless of any changes in product size.

It is reported by the inventor that this method is cheaper inasmuch as the polyethylene used is only the precise amount needed to cover the product, whereas in prefabricated polyethylene bags a certain amount of overhang is lost.

This method of packaging is also recommended by the inventor for extending storage life of frozen bread. (Quick Frozen Foods, March 1958.)

Ecuador

NEW FISHING LAWS PROPOSED: About the first of April the Ecuadoran Cabinet approved two new fishing laws which are expected to be approved by the President and promulgated.

The first of these new laws will open the Gulf of Guayaquil to foreign fishing vessels which have obtained the proper permits to operate in Ecuadoran waters. The principal benefit of this measure to foreign fishing vessels will be in the taking of bait for tuna fishing since the Gulf of Guayaquil abounds in bait which is very scarce in deeper waters.

The second of the proposed new bills is a complete general fishing law which the Ecuadoran Director of Fisheries states is modeled on the Peruvian law.

Ecuador hopes through these two measures to encourage the United States tuna fleet to return to Ecuadoran waters. Several years ago Ecuador had an income of around a half million dollars a year from the licenses and permits bought by United States tuna boats. This income has dwindled to almost nothing since the facilities granted by Ecuador have recently been extremely limited, particularly in the case of bait taking. Under the new laws it is probable that United States tuna boats will return in force to Ecuadoran waters and to the high seas off the coast of Ecuador and that Ecuador's income from fishing licenses will return to the level of several years ago (U. S. Embassy in Quito, dispatch dated April 3, 1958).

* * * * *

SHRIMP FISHERY TRENDS: Late in March 1958 considerable attention was given by the Ecuadoran press to the status of the shrimp export industry, due to rumors that official approval would be given for the importation of foreign-built shrimp vessels. These rumors caused some criticism regarding the need to protect Ecuador's small shipbuilding industry. In addition, some fears were expressed as to the future of the shrimp resources off the coast if unregulated competition for the available supplies took place, an April 14, 1958, dispatch from the United States Embassy in Quito reports.

Honduras

FISHERIES TRENDS: The fisheries of Honduras are located principally in the vicinity of the offshore Bay Islands, in the Carribbean Sea. During 1957, construction of a freezing plant was started which will, when completed, provide facilities for a fleet of five vessels. The company operating the fishing vessels expects to supply the Honduras market, but the bulk of the shrimp catch will be exported to the United States, according to a March 1958 dispatch from the United States Embassy in Tegucigalpa.

Iceland

ELECTRIC TRAWL DEVELOPED FOR HERRING FISHERY: Two Icelandic brothers have sought a patent for an electric trawl which is specially adapted for use in the herring fisheries but also can be used for other fish, according to Fiskaren (April 9, 1958), a Norwegian fishery trade paper. Patents are being sought in Denmark, Germany, the United States, and many other countries. A patent has

been issued in Sweden and it is expected that the first electric trawl of this type will be built there.

The trawl is constructed in such a way that an electric current is sent through the towing cables from a generator in the stern of the vessel. This creates electric fields in the water around the trawl so that the fish are stunned and drawn into the trawl. The method is said to be very simple and does not require unusual or heavy expenses.

Icelandic fishery authorities have indicated an interest in the trawl and are following closely the further experiments.

* * * * *

SELECTED FISHERY EXPORTS, 1957: Iceland's exports in 1957 include several fishery items of interest to the United States fisheries. There was a considerable increase in exports of herring oil, herring meal, and fish meal as compared with 1956. Exports of frozen fish and ocean perch meal were lower (Statistical Bulletin, January 1958, National Bank of Iceland).

Selected Icelandic Fishery Exports, 1956 and 1957

Product	1957		1956	
	Qty.	Value 1/	Qty.	Value 1/
	Metric Tons	US$1,000 (FOB)	Metric Tons	US$1,000 (FOB)
Frozen fish	57,089	19,938	57,480	20,243
Herring oil	8,664	1,652	5,331	1,047
Herring meal	8,090	1,262	1,876	292
Ocean perch meal	4,940	728	5,914	866
Fish meal	24,264	3,658	20,278	3,053

NOTE: VALUES CONVERTED AT RATE OF 16.26 KRONER EQUALS US$1.

Japan

KING CRAB CANNERY VESSEL SAILS FOR BERING SEA: The 5,385-ton crab cannery vessel Tokei Maru sailed early in April 1958 for Bristol Bay, in the Bering Sea, to fish for and process king crabs. The first vessel of its type to leave Japan this year, it is expected to return with 684 tons of canned crab meat, according to a news release from Hakodate.

* * * * *

SALMON FISHING FLEETS LEFT FOR NORTH PACIFIC ON MAY 5: The 1958 salmon fishing season in the North Pacific was initiated on May 5, 1958, when 16 mothership fleets departed for the fishing grounds. This is the same size fleet as the one that operated in 1957. Only one fleet with 28 catcher boats will operate in the Okhotsk Sea in accordance with the new Japanese-Soviet fisheries agreement, while the other 15 fleets will operate in the Aleutians area west of 175° W. longitude. Last year two fleets operated in the Okhotsk Sea.

The quota this year is 110,000 metric tons (last year 120,000 tons). The total number of catcher boats operating this year is about the same as last year. In 1957 a total of 461 catcher boats were attached to the 16 mothership vessels. The Japanese fleets generally start operating in the easternmost zone and work westward as the season progresses. It is the early season's fishing that yields the bulk of the Japanese red salmon catch, and as the fleets approach the waters off Kamchatka the Asian-spawned pink salmon predominate.

The Japanese Fisheries Agency has announced detailed plans for sending survey vessels to the fishing grounds. Eight survey vessels, headed by the 1,098-ton Toko Maru, are scheduled to study the salmon resources along the Kamchatka Peninsula. The press had announced that the studies would include the Okhotsk Sea, but official Japanese sources state that the final decision on this matter has not been reached.

Also on May 2 each fleet was assigned its catch quota. The total quota for mothership salmon fishing during 1958 was set at 91,667 tons (of which 6,000 tons was assigned to the Okhotsk fleet). Shore-based salmon fishing vessels based on Hokkaido have been given a quota of 18,333 tons.

Prices to be paid by mothership operators to catcher boat operators during the 1958 salmon season were established at a level 5-6 percent lower than for the previous year. By species the following prices were agreed upon: red salmon ¥300 kan (10 U. S. cents a pound); white salmon ¥125 per kan (4 U. S. cents a pound); pink salmon ¥75 per kan (2.5 U.S. cents a pound); and king salmon ¥205 per kan (6.9 U.S. cents a pound).

NOTE: CONVERSIONS MADE AS FOLLOWS: 1 KAN EQUALS 8.27 POUNDS; ¥360 EQUAL US$1.

Mexico

ENSENADA FISHERY TRENDS, FIRST QUARTER 1958: Spiny Lobster: The open season for spiny lobsters on Mexico's west coast closed on March 15, 1958, with a catch of about 1.8 million pounds. As a catch of 2.0 or more million pounds had been anticipated, the fishermen in this area considered it a poor season. The catch for the last month of the season fell far below normal due to heavy rains and ocean storms. Prior to the opening of the season, an Ensenada spiny lobster company had contracted to purchase the entire anticipated catch at 45.5 U. S. cents a pound provided the catch reached or exceeded 2.0 million pounds. As the catch fell below this amount, the price paid was only 44.5 U. S. cents a pound, which reduced the income to the lobster fishermen.

Canning: The severe storms also had an adverse effect on the Ensenada fish canneries. One firm reported curtailing operations by about 30 percent because of lack of fish. With improved fishing weather it was expected that operations would return to normal.

Abalone: Informal studies are under way to find ways and means of increasing the abalone catch. Fishermen in the area are trying to have the present January-February closed season extended in order to allow more time for spawning, an April 9, 1958, dispatch from the United States Consul at Tijuana reports.

* * * * *

GULF OF MEXICO PORTS RESTRICT SERVICES TO FOREIGN FISHING VESSELS: A new order issued recently by the office of the Mexican Secretary of the Navy, states that all fishing boats of foreign nationality touching any Mexican Gulf of Mexico port can obtain provisions, including food and fuel, for 48 hours only. But the vessels cannot buy ice or equipment since it is believed that with the amount of provisions authorized the vessels can reach their home ports. Repairs to boats will be authorized directly by the Director General of the Merchant Marine, following investigation of the condition of the boats by the port captains and designated inspectors. (United States Consul, Tampico, Mexico, March 31, 1958.)

Norway

FAILURE OF WINTER HERRING FISHERY DUE TO COLD SURFACE WATER: According to a Norwegian fisheries consultant, ocean investigations indicate that the failure of the 1958 winter herring fishery was due to the incursion of cold surface water from the Baltic Sea. He stated that there was actually enough herring

off the Norwegian Coast to have enabled the fishermen to land twice as much as in a normal year, but the Baltic water drove the herring to greater depths than usual. When the herring were caught and brought to the surface they went wild and burst the nets.

The fisheries consultant maintains that there is no reason to be pessimistic about the future of the herring fishery. Only historical data are available for appraising the so-called herring cycles, he said, and assumptions that herring will disappear from the Norwegian coast are based on mere hypotheses. If this should occur ocean research would provide ample warning (News of Norway, April 17, 1958).

* * * * *

FISHERIES TRENDS THROUGH MARCH 15, 1958: Cod: During the week ending March 15, 1958, in Finnmark, Lofoten, and in the districts south of Lofoten landings of spawning cod were higher. At Troms and Vesteralen the seasonal falling-off seems to have begun. Landings for the season through March 15 totaled 39,262 metric tons as compared with 36,950 tons at the same time last year. Of the landings 14,565 tons were sold for drying, 15,619 for curing, and 9,078 tons for fresh purposes. A quantity of 1,665 tons of cod liver oil was produced; 1,175 tons of roes were sold for curing, and 1,228 tons for fresh purposes and for canning.

Herring: The winter herring fishery improved in the Haugesund district where the net fishing was mostly satisfactory, and purse seiners had some catches at sea off Alesund during the week ending March 15. Shoals of winter herring have been found off the coast of Nordland county as far north as off Lofoten. Purse seiners have been in touch with these shoals. The total landings of winter herring as of March 15 were 319,947 metric tons of which 59,713 tons were sold for fresh purposes, 79,008 tons for curing, 7,171 tons for canning, 164,008 tons for reduction, and 10,047 tons for other purposes.

* * * * *

HERRING FISHERMEN GRANTED SPECIAL FINANCIAL CREDIT: The Norwegian Government announced early in March 1958, that the Bank of Norway, through commercial banks, will furnish fishermen in economic difficulty with short-term working credit. The credit will be limited to kr.1,700-1,800 (US$238-252) per fisherman. This aid has been made necessary by the very poor winter herring season this past year (the second during the past two years) and is limited to credit only for herring fishermen. This measure differs from the recent relief measures granted to the cod fishermen, which calls for a fund of kr.15,000,000 (US$2.1 million) to support cod prices (United States Embassy in Oslo, dispatch March 14, 1958).

* * * * *

HERRING OIL PRODUCTION DOWN SHARPLY IN 1958: Norwegian herring oil production from the 1958 winter and spring herring fishing season (ended April 2) was less than one-third that of 1957--about 17,000 short tons as compared with 55,000 tons in 1956.

If the herring catch this summer is average, herring oil output for 1958 should be around 28,000 tons, against 72,750 tons in 1957, and a record of 114,630 tons in 1956. This is the lowest herring oil yield since 1947, when only 22,000 tons were produced, and is slightly less than the 29,400 tons produced in 1949.

Panama

EXPANSION OF SHRIMP INDUSTRY SLOWS DOWN: The rapid expansion of Panama's shrimp fishery which started in mid-1956 and swelled capital investment to an estimated US$6.2 million by June 1957 appears to have come to a halt. To the extent possible, proposed expansion plans have been deferred until the future of the industry can be reappraised. Disappointing returns of new independent boat owners has caused new risk capital to withdraw from the industry. This "new" capital, which was the principal contributor in the expansion of the shrimp fleet, flowed from the Panamanian professional man, the businessman, and even the skilled carpenter with the anticipation of a quick fortune. Panamanian boat builders, who were unable to accept additional orders for new boats in July 1957, report numerous cancellations, and in some instances stop orders after the boat is under construction. Uncertainty exists with respect to existing orders, the United States Embassy in Panama states in a March 17, 1958, dispatch.

Panama's shrimp fleet numbered 203 trawlers as of January 22, 1958, an increase of 113 boats since June 1956 but a substantially greater increase in actual fishing power as most new boats are the 60-foot trawler. The rapid expansion in the fleet has placed a premium on experienced, reliable captains and trained fishing crews. Many of the boats have been placed under newly-licensed captains, (whose past experience was that of a seaman) and untrained crews. New boat owners have found the catch per trip disappointingly short of that anticipated in estimating earnings on their capital investment. Many boat owners suspect bootlegging of shrimp by the vessel at interior ports and "over the side." Experienced members of the shrimp industry are concerned that the sharply-reduced catches of the boats per trip may indicate that Panama's shrimp resources are being overfished.

There are seven shrimp packing companies presently operating in Panama. A new company has a small freezing plant located near the national abattoir in the suburbs of Panama City and is owned by the original organizers of a fish meal plant. Only three boats are working for the company, two of which are company-owned.

Forty-six trawlers were added to the shrimp fleet in the seven-month period, June 1957-January 1958. The fleet of one company has experienced the largest increase with a total of 18 trawlers. All the trawlers are independently owned. Three other companies have increased their fleets by eight each. The expansion pattern has been for the established shrimp companies to hold their investment in boats to normal replacement and expand their fishing fleet through contract with independent boats. Three-fourths of Panama's shrimp fleet is working for two companies. These two companies account for about 80 percent of the total production of frozen shrimp.

In 1957 Panama exported an estimated 8.2 million pounds 1/ of frozen shrimp as compared with 6.0 million pounds 2/ shipped in 1956. With allowance for an overestimate in 1957 export figures, shipments for the year are believed to have exceeded previous records by over 2 million pounds. On the basis of available data, the export price averaged just under 75 cents a pound in both years. Total catch is not available, but allowing 800,000 pounds for consumption in the Panamanian and Canal Zone markets, 1957 production approximated 9 million pounds. The increase in production of between 2 and 2.5 million pounds was due almost entirely to the extraordinary catch of pink shrimp. Generally the pinks are taken in abundance for two to three weeks in the month of March. In 1957, the season started in November and by the end of January over 1 million pounds had been taken. The season reached its height in the last week of February but continued on through March. The total take is believed to have exceeded 3,000,000 pounds. The catch of large whites for the year held at about the same level as in 1956.

Trade reports that the catches of the boats have declined sharply. The average catch per trip is around 100 pounds per day. For a five- to seven-day trip the boat take is now from 400 to 700 pounds as compared to 1,500 to 2,100 pounds a year ago. Many of the independent boats are extending their trips to as much as 23 days in a hope of increasing their catch. The loss in spoilage, however, offsets a large part of the gain after the tenth day out. Boat maintenance costs have increased sharply since the shortage developed in experienced fishing captains and crews. Trade recognizes that 1957 cannot be considered a normal year as radical changes in fishing patterns were noted all along the Pacific Coast. Trade also recalls that the catch per boat in 1952 and 1953 was about the same as the present take although Panama's shrimp fleet numbered less than 20 small trawlers.

The pink shrimp appeared in the Gulf within reach of the fleet February 29, 1958. Catches, however, were spotty and were located in rocky areas which were difficult to fish without ruining the net. The heavy run was expected within the next two weeks.

As of January 22, there were 12 boat-building yards in operation in Panama City with three additional boats under construction by independents on the beach. There are 59 boats under construction in Panama City and 16 more boats reported under construction in Taboga, Guarare, Garachine (Darien), and Colon. Most of the new boats are the 60-foot trawler with a gross tonnage of 59.9 and a net of 38.7. Completion of these boats will swell Panama's shrimp fleet to 278 trawlers. Boat yards report an additional 35 trawlers on order. However a number of orders are not considered firm; construction is known to have been suspended on three boats. It is reported that 6 or 8 shrimp boats have moved to El Salvador and 2 or 3 to Colombia and Brazil. Several others are expected to go to Colombia. Allowing for normal replacement of overaged boats and transfer or sale of independently-owned boats, particularly those built and owned by capital interests outside the shrimp industry, the Panama shrimp fleet probably will level off at 250 to 275 trawlers.

1/ PRELIMINARY FIGURES BASED ON MONTHLY EXPORTS.
2/ REVISED ON BASIS OF DATA RECORDED FROM SHIPPING MANIFEST.
NOTE: IMPORTS OF SHRIMP BY THE UNITED STATES FROM PANAMA IN 1957 TOTALED 8,378,000 POUNDS ACCORDING TO UNITED STATES DATA.

Peru

ANCHOVY AND BONITO LANDINGS LOWER IN 1957/58 SEASON: Sharply curtailed supplies of anchovies and bonito have resulted in higher prices for fish meal and canned bonito produced in Peru. It is estimated that the bonito pack for the 1957/58 season will be about 600,000 cases, only one-third of the pack for 1956/57. A survey made by a leader in the industry showed that the canning and fish meal plants in the Chimbote area were operating at about 20-25 percent of capacity for this season of the year.

Catches of anchovies for the fish meal plants have been good in a cold-water area 150 miles south to 50 miles north of Callao, but because of the distance involved these catches cannot be transported to the Chimbote area without spoiling, the United States Embassy at Lima reports in a March 10 dispatch.

* * * * *

REPORT OF JAPANESE FISHING OFF COAST UNCONFIRMED: None of the public or private news sources contacted in Peru were aware of Japanese fishing off the Peruvian coast. These sources stated that there is absolutely no arrangement between the Government of Peru and the Japanese concerning fishing off the Peruvian coast. No permits or licenses have been issued to Japanese vessels and none have been applied for. Whether or not applications have been made to Peruvian officials abroad is unknown, an April 15, 1958 dispatch from the United States Embassy in Lima reports.

Poland

OCEAN FISH CATCH: Poland's total ocean catch of fish in 1957 amounted to 125,000 metric tons--2½ times more than the catch in 1948, according to the April 4 issue of Trybuna Ludu. Plans for 1958 call for a 15-percent increase over 1957, with changes contemplated in the "exploitation system" of open sea fishing and in the catch assortment. The 1958 plan calls for a catch of 6,000 tons of herring.

With an eye on the rapidly growing Polish population (500,000 increase annually), a catch of 200,000 tons in 1960 and 500,000 tons in 1975 will be needed, states an April 8, 1958, dispatch from the United States Embassy in Warsaw.

The long-range plan obviously calls for rapid construction of a long-range, modern fishing fleet, equipped with the appropriate catching and processing equipment, and based on extensively developed shore and distribution facilities. To date the inadequacy of shore processing and refrigeration facilities has limited the total fish catch, and has been the cause of serious spoilage and waste.

Portugal

CANNED FISH EXPORTS, JANUARY 1958: During January 1958 Portugal's exports of canned fish amounted to 3,078 metric tons (195,510 cases), valued at US$1.8 million, as compared with 2,315 tons, valued at US$1.5 million, for the same period in 1957. Sardines in olive oil exported during January 1958 amounted to 2,238 tons, valued at US$1.3 million.

In January 1958 the leading canned fish buyer was Germany with 604 tons (valued at US$352,000), followed by Italy with 322 tons (valued at US$178,000), the United States with 255 tons (valued at US$207,000), Belgium-Luxembourg with 226 tons (valued at US$122,000), and Great Britain with 224 tons (valued at US$125,000). Exports to the United States consisted of 104 tons of sardines, and 151 tons of anchovies. (Conservas de Peixe, March 1958.)

Portuguese Canned Fish Exports, January 1958

Product	1958	
	Metric Tons	US$ 1,000
Sardines in olive oil	2,238	1,283
Sardinelike fish in olive oil	403	276
Sardine & sardinelike fish in brine	69	19
Tuna & tunalike in olive oil	76	61
Mackerel in olive oil	278	139
Other fish	14	11
Total	3,078	1,789

* * * * *

CANNED FISH PACK, JANUARY-NOVEMBER 1957: The total pack of canned fish for January-November 1957 amounted to 53,493 metric tons as compared with 50,644 tons in the first 11 months of 1956. Canned sardines in oil (31,300 tons) accounted for 58.5 percent of the January-November 1957 total pack, higher by 8.3 percent than the pack of 28,902 tons for the same period in 1956.

The Portuguese pack of canned sardines in oil totaled 6,818 tons during November 1957. The pack of all canned fish in November 1957 amounted to 7,619 tons, the March 1958 Conservas de Peixe reports.

Portuguese Canned Fish Pack, January-November 1957

Product	Net Weight	Canners' Value
	Metric Tons	US$ 1,000
In Olive Oil:		
Sardines	31,300	18,767
Sardinelike fish	11,049	5,418
Anchovy fillets	2,879	2,866
Tuna	1,496	1,092
Other species (incl. shellfish)	744	490
In Brine:		
Sardinelike fish	4,976	1,248
Other species	1,049	297
Total	53,493	30,178

NOTE: VALUES CONVERTED AT RATE OF 28.75 ESCUDOS EQUALS US$1.

* * * * *

CONSUMPTION OF FISHERY PRODUCTS INCREASES: At a launching ceremony held at Viana do Castelo a government delegate to the fishing industry stated that Portugal's consumption of fishery products had increased from about 68.3 pounds per capita in 1942 to about 114.5 pounds in 1957. He also stated that Portugal ranks third among European countries in per capita fish consumption. The increase has been made possible in part by gains in the number and the efficiency of the fishing fleet.

The 1958 catch, he stated, should be greater than in 1957, with four new cod fishing vessels, 7 new ocean-going trawlers, and 10 new coastal trawlers.

EDITORS NOTE: PROBABLY REFERS TO PRODUCT WEIGHT RATHER THAN EDIBLE WEIGHT, BUT THE REPORT DID NOT SPECIFY.

South-West Africa

FISHING INDUSTRY REVIEW: Fishing, an industry that has gained major importance only since the end of World War II, plays an important part in the economy of South-West Africa. Investment in the industry amounts to over £4 million (US$11.2 million). Most of the fishery companies in South-West Africa are registered companies which originally stemmed from Union of South Africa companies. The most important products are sardines (pilchard) and spiny lobster.

Table 1 - South-West Africa's Production of Sardine and Spiny Lobster Products, 1950-57

Year	SARDINES (PILCHARDS)						SPINY LOBSTER					
	Canned		Meal		Oil		Canned		Frozen Tails		Meal	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000	1,000 Lbs.	US$ 1,000
1957	85,676	10,746	93,536	4,654	21,586	1,672	1,803	1,518	1,374	1,058	3,369	151
1956	65,520	8,218	99,310	4,970	26,190	2,030	1,995	1,674	776	596	2,778	104
1955	46,308	5,807	103,756	5,194	23,718	1,859	2,350	1,974	905	697	3,806	160
1954	34,080	4,276	108,204	5,415	37,384	2,618	2,542	2,136	635	490	4,540	171
1953	21,160	2,962	123,010	5,166	21,252	2,083	2,740	2,304	1,096	692	5,220	151
1952	5,225	792	74,646	3,136	16,204	1,588	2,893	2,430	1,937	1,221	4,646	148
1951	3,867	585	34,690	1,456	9,638	944	1,924	1,078	415	260	3,274	101
1950	-	-	6,808	286	-	-	1,688	899	448	280	2,784	67

NOTE: VALUES CONVERTED AT RATE OF £1 EQUALS US$2.80.

The principal market for frozen spiny lobster is the United States and the product is shipped on United States vessels. There is also a well-established market for canned lobster, equally divided between the United States, United Kingdom, and Belgium.

Canned sardines are another important product of the fishing industry, but the United States is not considered a good market. The primary markets for this product are the United Kingdom, countries along the west coast of Africa, and Singapore. Only when the California sardine catch fails does trade with the United States become important. When this happens, as it has in recent years, various United States firms send representatives to South-West Africa to supervise the canning of sardines which are then sold under their labels.

Table 2 - Value of Principal Fishery Products Exports from South-West Africa, 1955-57

Product	1957	1956	1955
	. . . (US$1,000) . . .		
Sardine, canned	6,339	6,376	1/
Spiny Lobster, canned . .	1,593	2,013	2,050
Fish Meal	4,141	5,438	4,889
Other Fish	2,397	409	4,379

1/ INCLUDED IN OTHER FISH.

The principal income from sardines is derived from fish meal and oil. Exports of these products are restricted by the Union of South Africa to 75 percent of production. The United States and Europe provide a ready market for exported meal. All of the oil production is consumed by the Union of South Africa. Production of meal and oil has been more profitable than canning--in 1957 only 17 percent of the sardines caught were canned and the remainder were processed into meal and oil.

There are at present 6 factories in Walvis Bay which process sardines and two companies which handle "white fish" (snook, kobbeljou, kingklip, steenbrass, skates, and others). In Luderitz there are 6 factories which process spiny lobster. The number of sardine and spiny lobster factories is limited by the South-West Africa government. There are no indications that the number of factories, for either spiny lobster or sardines, will be increased in the near future.

In efforts to establish a stable industry, the Government has established catch limits or quotas for spiny lobster and sardines. In addition, strict regulations controlling the finished products have been applied to insure high quality in a competitive foreign market. Except for catch limits, the fishing industry has not been regulated. The effect of the present regulations has been to force the industry to adopt efficient methods in order to profit from the legally limited catch. There is no quota on "white fish," reports a dispatch from the United States Embassy at Pretoria, dated April 3, 1958. But there is a catch quota on spiny lobsters. The present catch quota for sardines will remain at 250,000 tons per season until the extent of the fishing area has been determined by governmental research of currents, temperature, and other factors that affect the fish population. It is the Government's wish to insure a stable fishing industry.

In regard to future sardine catches, one important warning sign that has appeared recently is that too many immature fish are being caught. Considering the natural mortality, plus the decline due to the catch, there is a question of replacement of the breeding stock. It is the opinion of some fishery experts that the sardine fishing industry is in danger, although up to the present stocks of sardines have been stable.

* * * * *

SPINY LOBSTER FISHERY THREATENED BY OFFSHORE DIAMOND MINING: The granting of another concession to a diamond dredging and mining company for a ten-year period for prospecting along an area extending from the high-water mark seaward for three miles, has raised fears as to the future of the spiny lobster fishery. The area granted to the diamond prospecting firm includes some of the best fishing grounds for spiny lobster and the packing firms at Luderitz depend on the catches from this area for raw material. If dredging and similar operations take place in this area, the grounds may be ruined and the spiny lobster industry, one of the oldest in the history of the territory, may be placed in a serious position.

A similar concession previously granted along the coast south of Luderitz menaces fishing grounds in that area. These spiny lobster fishing grounds have helped to build up and sustain the spiny lobster fishery for 40 years.

Over US$2.8 million have been invested in the spiny lobster fishery at Luderitz and, in spite of the income that the Territory has received from this industry, especially during some of the most difficult years of financial stringency, it now seems that the fisheries will have to give way to diamonds (United States Consulate, Cape Town, March 28, 1958).

Spain

VIGO FISHERIES TRENDS, JANUARY-FEBRUARY 1958: Fish Exchange: Landings of fish at Vigo, Spain, during January 1958 amounted to only 7.0 million pounds. This was a drop of 3.7 million pounds from the preceding month, and about 0.7 million pounds from January 1957. The primary cause of this decrease was the bad weather which kept the fishing fleet in port during the latter part of January and early February.

Small hake was the leading species sold over the exchange (2.0 million pounds), followed by dollarfish (1.4 million pounds), and horse mackerel (0.9 million pounds).

The catch in January this year was valued at about US$938,716 (at the official rate of exchange $1.00 = 42 pesetas) or about US$11,900 above January 1957. This higher value was due to the fact that the average price rose from 10.9 U. S. cents per pound to 13.6 U. S. cents a pound this January.

A closed season on sardine fishing or canning from February 15 to April 15 is in effect. Sardine landings in January 1958 were 13,550 pounds, a drop from the previous month's 371,000 pounds and 289,000 pounds in January of 1957.

In February, the catches sold over the Vigo Fish Exchange rose to 9.0 million pounds, almost 2.4 million pounds above the February 1957 sales of 6.6 million pounds. Dollarfish was the most prominent species landed with a total of 3.1 million pounds. Catches of this species usually reach their peak in February. Second highest landings were small hake (2.1 million pounds).

Total value of the landings in February this year was about US$907,000 at the official rate of exchange.

Fish Canning and Processing: Cannery activity was practically nonexistent during the month of January. Canneries normally devoted themselves to canning anchovies in brine. Only 7,000 pounds of fresh fish (mostly dollarfish) were bought from the exchange for canning. Another 9,800 pounds were bought for smoking and drying. In January 1957, 172,000 pounds and 550,000 pounds were bought for these two purposes.

During February 1958 cannery work picked up again with a total of 366,000 pounds of fresh fish bought from the exchange for canning. Fish bought for smoking and salting, dropped to 3,545 pounds. This compares with 88,200 pounds of fresh fish bought during the same month last year for canning and 618,000 pounds bought for other purposes.

Fishing Industry Taxes: On January 11, 1958, the city of Vigo lost the final round in its legal fight with the fishing industry when the Supreme Court ruled that the municipality could not extend its traditional tax of 2-1/2 percent to fish and shellfish not using the facilities of the fishing port, such as the Fish Exchange, packaging stalls, etc.

This followed a ruling made in the fall of 1957 by the Provincial Tribunal granting the fishing industry, on their payment of the provincial wealth tax (a depletion tax), an exemption to a maximum of 90 percent on taxes paid to the municipalities, with a 100-percent exemption in the case of cod, smoked fish, and salted fish. The ruling that cod was semi-processed when coming into port precluded the Port Works Authority, which administers the fishing port, from assessing their 2 percent surcharge on this type of fish. As a rule, the Port Works Authority would impose their 2 percent charge on all landings which they interpreted to be non-processed, regardless of whether use had been made of port facilities. These rulings, according to fishery members, are a little too late in one respect, for the cod industry has already been driven to other ports.

At stake, however, is the newly-developing tuna industry, and it is hoped that these rulings will serve as a basis to discourage the province and municipality from what fishermen consider overtaxation. At the moment, tuna landings are considered by the Port Works Authority as coming under their jurisdiction, i.e., non-processed, whereas, fishermen consider that the tuna is landed preprocessed (frozen), and warn further that unless the port changes its mind the tuna fleet will move elsewhere.

Exports: The Spanish-French commercial agreement of December 4, 1957, will run to October 31, 1958. According to this commercial agreement Spain will export to France during this period over US$1 million worth of dried and salted fish, anchovies, mussels, mollusks, and crustaceans. Almost half of the exportation will be dried and salted fish. In return, France will ship approximately US$70,000 worth of cod to Spain, the United States Consulate at Vigo reported on March 7, 1958.

Sudan

NEW DIVING EQUIPMENT MAY INCREASE HARVEST OF SEA SHELLS IN RED SEA: A sea-shell fisheries expert of the Food and Agriculture Organization (FAO), Rome, Italy, left in April for the Sudan where he will introduce new, simple diving equipment for use in the Red Sea in diving for trochus, mother-of-pearl, and other sea shells used for making buttons. He will be a year on his assignment in the Sudan.

"Introducing improved diving techniques will be only one part of my duties," the expert explained in an interview before leaving Rome for Khartoum, Sudan. "I shall be helping the Sudanese Government to improve the Red Sea shell fisheries, survey the present and potential shell beds, and institute proper management of the fisheries."

The new diving equipment, which was invented by an Italian engineer, is hand-operated and simple in construction and use. Experimental dives by FAO's senior fishing gear expert led to the decision to test whether it might be suitable for the Red Sea shell divers, who do not even use goggles or swimfins.

"The equipment enables a diver to go down quite deep," said the expert, "but I expect generally to be working at about 30 to 50 ft."

"The meat of trochus are edible and when smoked are considered a delicacy in such countries as Japan, although sea-shell fisheries are founded on the value of the shells. Still, we can get a ton of meat from ten tons of trochus shells."

Surinam

SHRIMP FISHERY TRENDS: During the week of March 30, 1958, the news concerning the Surinam Government's decision to assist a United States-Surinam shrimp processing company by construction of an ice plant and wharf and payment of the expenses of operating the factory and trawler Coquette became public.

The Coquette, meanwhile, has been operating offshore with modest success. Despite the fact that this is one of the rougher periods of the year off the Surinam coast and the crew still new to the area, the vessel reportedly is averaging one trip a week. In March, the Coquette, in four short trips, brought in about 4,400 pounds of large shrimp and 3,300 pounds of marketable fish. In three successive nights of fishing on one trip the catch was 2,500 pounds of large shrimp. The shrimp were frozen for export and the fish sold on the local market.

Work on the ice plant and wharf has been delayed pending a change in the deed for the shrimp-processing plant property to allow the Government to retake title to those portions on which the new facilities will be built. This is now believed completed, so work should soon be started.

Early in April, a Japanese national residing in Canada, visited Surinam at the instigation of the manager of the shrimp-processing firm. The Japanese national is a managing director of a large Japanese fishing company, which reportedly has associated companies in Brazil, Cuba, Canada, and Chile. This company operates large vessels out of Pernambuco, Brazil, principally for fish. The shrimp company manager hoped to interest the Japanese in using the local facilities, but the latter did not appear enthusiastic, since his craft do not have to depend on ashore facilities to a very great extent, an April 9, 1958, dispatch from the United States Consul at Paramaribo reports.

U. S. S. R.

FISHING ACTIVITY IN NORTHWEST ATLANTIC INCREASES: Fishing activity in the Northwest Atlantic Ocean by Russian vessels is obviously increasing. According to a broadcast in Norwegian

by Radio Moscow on January 5, 1958, large trawlers from Murmansk now fish as far west in the Atlantic as Greenland and Newfoundland waters. Further, it was broadcast that the U. S. S. R. Polar Institute in recent years has tried to find new fishing grounds in the West Atlantic; on the eastern part of the Grand Banks of Newfoundland new ocean perch fishing grounds were discovered, and named the "Sverdlovsk Banks." (Fiskets Gang, January 30, 1958.)

The broadcast gave the following review of the Soviet fisheries in the North Atlantic: The population in northern Russia has fished for many centuries. At the end of the 16th century there were about 30,000 fishermen and fishery workers in the North. At that time fishing occurred not only along the Murmansk Coast but also at Cape Kanin and along the coast to the mouth of the Petsjora. Russians also fished at Spitsbergen and Franz Josef Land. The first one who indicated the great possibilities for the development of the fisheries in the Barents Sea was the Russian scientist Nikolai Kipovitsj in the beginning of that century. The trawl fishery started and was particularly speeded in its development from the 30's when the Soviet Union obtained a large trawler fleet. Today about 1/4 of the Soviet Union's fish catch comes from the Barents Sea and the North Atlantic. The most important varieties are cod, haddock, pollock, ocean perch, and herring.

Murmansk is the largest fishing port--not only in the Soviet Union but in the whole world. The trawler fleet in Murmansk includes the most modern freezership trawlers with stern trawling. These craft fish far out in the Atlantic Ocean and go clear to the coast of Greenland and to the Newfoundland Banks. A large number of fishing craft which fish for herring in the North Atlantic also have their base in Murmansk. In the harbor there are large cold-storage warehouses, canneries, and other operations which work for the fishing fleet.

In the offshore North Atlantic waters a large amount of scientific work is conducted with the aim of seeking fishery resources. It is the fishing industry's research institute--the Polar Institute--which conducts the research.

The exploration of fish comes directly under the fisheries administration. Along the Murmansk coast there are regular reconnaissance fleets for herring during the summer. All vessels which seek fish are equipped with special hydro-acoustic equipment.

In recent years Soviet researchers in close cooperation with the fishermen have discovered many new areas for trawl and gill-net fishing both in the Barent Sea and in the more distant waters. The north and northwesterly areas which have been fished in recent years are of great interest for trawl operations. In the summer there are many cod in those areas and therefore these areas steadily are of greater importance for trawl fishing.

The study of the vertical distribution of cod and haddock in the Barents Sea with the aid of hydro-acoustic instruments and with the help of underwater equipment has shown that it is not wholly correct to place these varieties of fish in the category of bottom fish. It has been found that for the most part they remain in the middle water layers and trawling gives poor results when one is not aware of this.

In recent years the Polar Institute has conducted research to find a new area for trawling in the western part of the Atlantic Ocean. In the eastern half of the Newfoundland Banks new ocean perch grounds have been found--the Sverdlovsk Banks. The trawl fleet also tags many ocean perch on the Kompitov Banks which recently were found west of Bear Island. The greatest part of the catch of cod, haddock and ocean perch is taken to Murmansk and frozen or cooked.

The Soviet Union conducts a large herring fishery both in and outside of the Barents Sea. Fat herring are fished with gill nets in the open sea and with purse seines along the coast. Even before World War II, Polar Institute had undertaken comprehensive research on the biology of the herring of Barents Sea. These experiments showed that the herring have their nearest spawning places in Lofoten. From there the young herring drift in the warm North Cape current to the Murmansk Coast. In the Barents Sea the young herring live until they become sexually mature after which they go back to the Norwegian Coast. Small herring from $1\frac{1}{2}$ to 2 years of age are found almost everywhere in the southern part of Barents Sea but in the greatest amounts along the coast and in the fjords of Kolahalv Island. Herring that grow until they are 3 or 4 years old have developed into the fat herring which is very tasty and in great demand in the markets of the Soviet Union. Research on the biology of the herring has made it possible to determine the most rational fishery methods.

The Polar Institute and the exploratory fishing vessels in the North Atlantic conduct comprehensive observations of the distribution and migration of the herring by tagging. For many years the Polar Institute has tagged young fish, herring, and bottom fish in the Barents Sea. These experiments have made it possible to predict the fertility of the individual generations of fish and to set up predictions for the outlook many years ahead. Most of the Soviet fishery research workers believe that considerably more cod and herring can be fished in the North Atlantic than at present, but the conclusion is that the young fish be spared. This is true equally for both cod and herring.

* * * * *

VESSELS USE FISH PUMP TO CATCH FISH ATTRACTED BY UNDERWATER LIGHT: Attracting fish by underwater light into dense shoals, then sucking them up by a fish pump has been successfully carried out by Russian fishermen in the Caspian Sea.

This development, which was started in 1951, is the subject of a paper by I. V. Nikonorov, of the Caspian Institute of Marine Fisheries submitted to the International Fishing Gear Congress at Hamburg last October.

In that year, 170 commercial fishing vessels were engaged in underwater light fishing, with a total catch of 17 million pounds. By 1956 the fleet had grown to 450 vessels and the total catch was 150 million pounds. Eleven ships equipped with pumps caught a total of 10 million pounds.

Before 1954 the fish "kilka" (including its anchovy form)--the most abundant fish of the Caspian Sea--were caught with a cone-shaped net.

The reason why "kilka" and many other fish are attracted by underwater light has not been established, and there is some controversy on the question. One view is that the attraction by light is a feeding reflex.

Daylight acts as a stimulus for an unconditional feeding reflex. In the dark an artificial light will produce the same effect stimulating a feeding reaction and inducing the fish to swim toward the source of light.

This is confirmed by a marked increase of the catch before dawn, when the feeding reaction becomes stronger and the approach of the fish to the source of light more intense.

"Kilka" will not approach a source of light placed above or beneath the level of optimum temperature, and all attempts to induce them were unsuccessful.

The electric lamps are enclosed in watertight fittings, and emit a flow in all directions. The size of the lamp is very small in relation to its range of action.

The stronger the source of light, and the wider the radius of attraction, the denser will be the concentration of "kilka" and the greater the catch.

There is some evidence that the density of "kilka" tends to decrease near a lamp with too great a brilliancy.

Fish enter the field of light some seconds after the underwater light is turned on. They approach close to the light, even brushing against the lamp. Commercial quantities are formed in 2-5 minutes.

"Kilka" approaching the critical zone try to get away. If the shoals are sparse some fish do escape, but when the concentrations are dense the foremost fish are prevented from swimming away by new arrivals who push them into the critical zone.

A nozzle with a sloping shear, which increases the area of the intake aperture, has been devised for the suction pump.

Over 30 ships are now fishing "kilka" with pumps in the Caspian Sea, and their fishing power is higher than that of ships fishing with cone nets.

It is claimed that pump-fishing gives greater labor efficiency, is labor saving, with higher production and lower operation costs. Great economics were made with the use of Diesel-electric motorships, fishing simultaneously with two pumps.

The author suggests further improvements, such as selecting the most suitable source of light to ensure dense concentrations within the active sphere of the sucking water current; and as an additional attraction, a path of light. He also advocates the use of small pumps of great capacity.

Further research may prove the value of pumps for fishing in other regions and for other pelagic fishes, such as sardines and saury, which react positively to underwater electric light.

Active controlling of fish movements by man is not impossible, and their behavior related to different physical phenomena may greatly alter technique and gear (The Fishing News, March 14, 1958).

United Kingdom

EXPANSION OF FOREIGN MARKETS FOR SCOTTISH FROZEN FISH URGED: In the British House of Commons, a member from Scotland said in March 1958 that there was in America, Canada, Africa, and Europe a great and growing demand for Scottish frozen fish.

He urged the Secretary for Scotland to take steps to empower the British White Fish Authority to finance a publicity campaign to increase "this potential source of wealth for Scotland."

The Secretary replied that the White Fish Authority's powers enabled them to promote the export of white fish and they were in close touch with the industry about the markets available overseas.

The member replied that, excellent though the work of the Authority was in many respects, their publicity campaigns in many foreign countries were not sufficiently extensive. Could the Minister do something to extend them? (Fish Trades Gazette, March 8, 1958.)

* * * * *

MARINE OIL IMPORTS: Imports of marine oils by the United Kingdom during 1957 increased 36.6 percent over 1956. Whale oil imports, the most important during both years, showed a marked increase of about 49 percent in 1957 as compared to 1956, the Foreign Agriculture Service of the U. S. Department of Agriculture reports in an April 21, 1958, dispatch from London.

United Kingdom Imports of Marine Oils, 1956 and 1957

Type	1957	1956
	(1,000 Lbs.)	
Cod-liver oil	2,899	598
Vitamin A oil	590	560
Sperm oil, unrefined	32,776	40,412
Whale oil	318,091	213,543
Others	7,762	9,908
Total	362,118	265,021

* * * * *

SILVER COD AWARD MADE FOR 1957: The British Trawlers' Federation "Silver Cod" was awarded on March 12, 1958, to the trawler Lord Beatty. The vessel landed 2,469 metric tons (about 5.4 million pounds), valued at £114,927 (US$321,796) ex-vessel, in 302 days at sea. The captain of the vessel takes over the trophy from the captain of the Lancella which won the award in 1956 for landing 2,871 metric tons of fish.

The Silver Cod trophy was first awarded in 1954 by the Federation as a means of encouraging the captains and crews to land more fish.

The trawler Lord Beatty did not start sailing until mid-February when other vessels had already landed two trips. The best trip of the vessel was on April 15 when landings of almost 392,000 pounds grossed £12,574 (US$35,000).

The Hull trawler St. Britwin was second. In 326 days the vessel caught 2,379 tons (about 5.2 million pounds), valued at £131,397 (US$367,912) ex-vessel.

The Diesel-electric Portia of Hull was third with 2,357 tons (a little less than 5.2 million pounds), valued at $363,457 after 337 days at sea. (World Fishing, March 1958.)