



Bizone Germany

HERRING FISHING VESSELS CONTEMPLATE EXTENSION OF FISHING GROUNDS: Due to the disappointing catch of fish, especially herring, during the 1948 season in the usual German fishing grounds, fishing-ship owners are giving serious consideration to extension of the customary grounds, according to an April 12 report from the American Vice Consulate at Bremerhaven. The three major fishing grounds now are the North Sea north of 57° N., off the Norwegian Coast, and to the south of Iceland. The extension of the fishing grounds westward towards Greenland is discussed, but until larger vessels capable of remaining at sea longer are built, vessels will continue to fish in the usual areas.

The mothership and floating-factory systems are not being seriously considered, due to the failure of a factory ship tried in the Baltic before World War II.

ELECTRICAL FISH-CATCHING DEVICE: In Hamburg, an old minesweeper is now being fitted with a device to catch sea fish electrically. It is expected to be ready for tests on the fishing grounds this summer.

The device consists of a special generator, and a special combination of electrodes and conventional nets. The electrodes set up an electric field which induces the fish involuntarily to begin to swim in the direction of the mouth of the net. The special generator is needed to set up a sufficiently strong electric field over a large area without a prohibitively great power consumption. When the device is used in fresh water, no special generator is needed.

The advantages of this system of catching fish are several:

1. By controlling the gradient of the electric field, it is possible to control the size of fish caught;
2. Since the net does not have to be dragged, it is possible to fish over a rocky bottom without risk of tearing the net;
3. Since the fish recover quickly with no ill effects from the influence of the electric field, they will arrive on the market fresher than trawl fish.



Canada

NEWFOUNDLAND JOINS CANADA: On April 1, Newfoundland became Canada's tenth province and, thereby, added new significance to status of the Canadian fishing industry in the national economy, according to the April 1949 Trade News of the Canadian Fisheries Department.

Newfoundland's union with Canada adds to the Dominion a province where about half the population depends on the fisheries. Newfoundland's fisheries production, valued at some \$35,000,000 annually, is an important addition to the Canadian fishing industry. Under the terms of Union, the Federal government has been given certain responsibilities regarding the general fisheries administration and the bait service in Newfoundland.

Arrangements are being made now by the Federal Department of Fisheries to integrate closely these administrative functions and the policies relating to them with those of the Newfoundland Fisheries Board whose powers so far as they relate to the export marketing of salted fish are being continued for five years after Union. In all, the Department has provided in its supplementary estimates the sum of \$1,250,000 for Newfoundland in 1949.

In order that there will be a single authority in Newfoundland responsible for all fisheries administration, the Federal authorities have asked the chairman of the Newfoundland Fisheries Board to serve, not only as chairman of the board, but also as chief fishery officer in the new province responsible for general fisheries administration, the bait service, and all other matters relating to fisheries.

The Department is also arranging to create a senior position in Ottawa to look after Newfoundland affairs. Newfoundland representatives on the Fisheries Price Support Board and the Fisheries Research Board of Canada are to be appointed shortly.

In connection with biological research, the work at the Newfoundland Fisheries Board's station at St. John's will continue under the immediate guidance and assistance of the Research Board. In addition, the services of the Board's Atlantic Experimental Station at Halifax will be extended to Newfoundland to carry out technological investigations in connection with processing and handling fishery products.

CANNING OF WHALE MEAT STUDIED: Experiments in the canning of whale meat for human consumption have been carried out by a British Columbia firm to determine relative costs in handling and canning this product.

The Chief Supervisor of Fisheries points out that the meat considered most desirable for this purpose is that of the finback and humpback taken from the lower part of the back on two slices along the body.

As to processing, the meat is cut into one-inch cubes by hand on the cutting tables after which it is placed in wire trays and immersed in boiling water containing $1\frac{1}{2}$ to 2 percent soda ash for 20 minutes for purposes of neutralizing traces of ammonia and to impart a more desirable flavor. The diced meat is then placed in one-pound tall salmon cans; $11\frac{1}{2}$ ounces of meat are used per can plus $5\frac{1}{2}$ ounces of highly flavored gravy. A total of 500 cases was produced from these experiments.

Labor costs were relatively high since cutting and trimming of the meat is a manual operation. Selection of the best cuts resulted in considerable waste. It is further reported that a line capable of handling 250 cases per day is being installed in the whaling plant at Coal Harbor.

WHITEFISH PROGRAM PLANNED: What may be an important step along the road leading to a solution to problems affecting Canada's whitefish industry was taken

by Federal and provincial fisheries officials and scientists in March when they met in Winnipeg to discuss an accelerated research program for this year.

The delegates, representing Alberta, Saskatchewan, Manitoba, Ontario, and the Federal Department of Fisheries, held their first meeting as a newly-formed Advisory Committee and appointed a standing scientific subcommittee to carry out a research program designed to form the basis for steps to be taken to improve the quality of whitefish stocks in inland lakes.

Federal financial aid has been offered to assist the provinces in carrying out the research program and the work will be under the aegis of the Fisheries Research Board Station at Winnipeg which will act as financial and administrative controller of provincial projects where federal public funds are involved.

The research program for 1949 drawn up by the subcommittee and approved by the Advisory Committee included experiments in the reduction of tullibee (cisco), experiments in the control of pike (jackfish) by electrocution and poison, and further studies on the parasites which attack fish with a view to their control.

PROGRAM FOR DEVELOPMENT OF FISHERIES: An extended program for the further development of Canada's fishing industry was announced May 5 by the Minister of Fisheries, according to the May 1949 Trade News of the Canadian Fisheries Department. The Minister's statement follows:

"The fisheries resources of Canada are among the greatest of any country in the world. This Government over the next five years should take further positive steps towards a greater realization of the great fishery potential of the Dominion. To help develop these resources and to expand the markets at home and abroad, the Federal Government should co-operate with the fishing industry in a programme of development on the following lines:

- (a) For the industry as a whole the Federal Government should aid both in the production and in the greater development of distribution, particularly in the domestic market. This may be achieved,
 - (1) By special efforts with the railway companies towards a rapid increase in the use of the new and specially designed refrigerator cars for fish. This will ensure proper carriage of high-quality fish from the sea and lakes to the cities.
 - (2) The Federal Government should co-operate with the industry immediately in the provision of terminal warehouses in the major cities, particularly Montreal and Toronto, these city warehouses to be designed and used for the handling of fish foods, and to aid in the collection and distribution of the highest quality products through retail stores everywhere.
 - (3) The Government should consider with the fishing industry the special steps necessary for improving the retail distribution of fish and getting the highest quality, inspected foods to the housewives.
 - (4) As a complement to this physical development, the Government should extend its advertising programme in co-operation with industry, covering the press and the other media and also concentrating on the other educational programmes necessary for the expansion of the domestic market for fish.

(b) The Federal Government should continue and expand its research work on the development of our fisheries resources and on the technological development of the fishing industry. It should also take special steps towards encouraging the application of these scientific results to industry, particularly in those areas of the country where development has lagged and the standard of living of the fishermen has consequently suffered. Some of these areas are rich in resources, and it is possible to raise the standard of living by improved techniques. The Federal Government should encourage the application of modern techniques by increasing its technical services to fishermen and also consider capital assistance where necessary. In these areas attention should be concentrated on,

- (1) The improvement in fishing methods, in types of boat and gear;
- (2) Improvement in shore plants, in the layout of plants, in canning techniques, in freezing and smoking; and in special cases in the encouragement of the establishment of reduction plants;
- (3) In the further improvement and development of the bait service.

"The initial steps in these directions have already been taken and some items covering this work are already included in the Estimates for this year. The groundwork for this expansion has been laid and the Federal Government should push that expansion in the immediate future."

"Special attention had been given to the local problem confronting the fishermen on the East Coast of New Brunswick and the Government was prepared to proceed without delay towards encouraging the establishment of two reduction plants and one cold storage with bait freezing facilities. These will provide a long-run solution to many of the local problems and would help further development and expansion of the local herring fishery."

FISHERIES DEPARTMENT ESTIMATES INCREASED: Operation of the Canadian Department of Fisheries during the current fiscal year will involve an estimated expenditure of \$8,439,175 according to the Department's estimates tabled in the House of Commons in April. This budget represents an increase of approximately \$2,000,000 compared with that of 1948-49 and includes the expenditure of \$1,242,835 in Newfoundland.

The Fisheries Research Board of Canada receives \$1,371,175 for operation and maintenance expenses. This includes \$239,135 for Newfoundland. For construction and improvements the Board receives \$181,000.

The entry of Newfoundland into Confederation brought new responsibilities to the Department. These are reflected in the estimates by votes of \$353,900 for Newfoundland Fisheries Board and \$408,400 for continuing Newfoundland's bait service. In all, the Department is anticipating expenditures totaling about \$1,242,835 in Newfoundland this year to take care of general fisheries administration.

The Fisheries Prices Support Board gets \$170,000 for operating expenses. This is a reduction of \$30,000 compared to last year's vote and is based on experience of 1948-49, the first full year of operation.

The Department's educational extension service, including a grant of \$3,000 for the Lunenburg Fisheries Exhibition, has been allotted \$190,000 this year. This provides for demonstrator-lecturer services and for constructing exhibits

and placing them in national and provincial exhibitions. Educational work in cooperative producing and selling among fishermen receives the sum of \$80,000.

The Department has been given \$100,000 which will be used as subsidies for the construction of small druggers, on the Atlantic Coast, through the medium of Provincial Fishermen's Loan Boards. The vote of \$100,000 for subsidizing the construction of bait freezing and storage facilities for bait represents an increase of \$50,000 over last year.

The sum of \$25,000 has been provided for investigation into transportation and storage facilities in wholesale and retail handling of fish and fish products.

BRITISH COLUMBIA SALMON EXPORT POLICY CONTINUED IN 1949: Salmon canneries in British Columbia, which provide gainful employment for thousands of shore-workers, will again this year be assured of supplies of the raw product for packing purposes.

The Canadian Fisheries Minister announced recently that the Government had decided to continue its 1948 policy of retaining for canning in Canada the season's catch of red or sockeye, pink or humpback, and chum or keta salmon. They may be exported, however, in a canned, salted, smoked or cured condition.

The export of chinook or king salmon in any form is not limited, however. Also, silver or coho salmon may be exported in any form until September 1. After that date its export in other than a canned, salted, smoked, cured or frozen condition, is not permitted.

The regulations, which are effective immediately, contain a provision in regard to chum salmon, caught in the 1948 season and in the fall of this year. After September 1, it shall be permissible to export from Canada 1949 frozen fall-caught chum salmon if it is established to the satisfaction of the Chief Supervisor of Fisheries, Vancouver; that such salmon is part of the 1948 catch.

Continuation of this policy of retaining in Canada certain species of British Columbia salmon for processing by Canadian plants was considered essential in the interest of continued salmon canning operations in British Columbia.

LOBSTER CANNING REGULATIONS CHANGED: Lobster canning in Canada is now allowed all year round on the Atlantic Coast as a result of a recent order-in-council which amends the regulations under the Meat and Canned Foods Act.

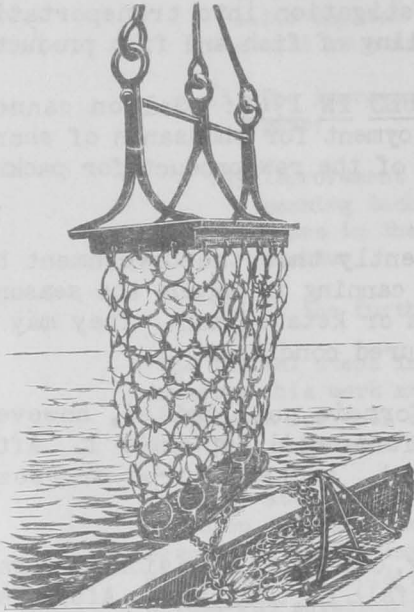
During the past number of years there has been a growing chilled lobster meat industry which has been allowed to put up fresh lobster meat in "slip-on" cover cans. These friction-top cans are not hermetically sealed as required under the canning regulations of the Meat and Canned Foods Act, and thus this industry was able to put up the chilled lobster all year. The canning of hermetically sealed lobster, however, was allowed only when the lobster fishing season was open in its area. Now canning is allowed at any time of the year.

Another order-in-council now allows lobster fishermen, when the lobster fishing opens on a Sunday, to place or set gear on the immediate preceding Saturday.

WHALING SEASON ON WEST COAST OPENS: The Canadian Department of Fisheries has issued licenses to three boats operated by one company for the hunting of whales in Northern British Columbia waters.

Last year the Company's three whalers accounted for the catching of 184 whales, and this year with an improvement in vessels it is expected that the catch will be greater. A fully equipped processing plant at Coal Harbor, Vancouver Island, will handle the expected increased production. Hunting for the whales got under way early in May.

WATER TEMPERATURES AFFECT DIGBY SCALLOP CATCHES: After three years of intensive investigations into the Digby scallop fishery, Canadian Federal fisheries scientists have come to the conclusion that water temperatures of the Bay of Fundy are a controlling factor in the remarkable yearly fluctuations in catch records, according to the March 1949 Canadian Department of Fisheries Trade News. Low temperatures in any particular year at the time the scallops spawn apparently result in a low production of seed scallops and a low production of commercial scallops seven years later, the average age of scallops in commercial catches being about seven years, according to the Fisheries Research Board's Biological Station at St. Andrews, N. B. Conversely, high temperature is related to high production.



THE STANDARD SCALLOP DRAG USED BY DIGBY FISHERMEN HAS A BAG MADE OF WIRE RINGS WITH AN INSIDE DIAMETER OF 2-3/4 INCHES.

A marked decline in the annual catch per boat during the past few years has caused the Board to investigate the fluctuations in an attempt to find their cause and possibly a method of predicting or even regulating them.

The standard scallop drag used in this area has a bag made of wire rings with an inside diameter of $2\frac{3}{4}$ inches and it retains many small scallops. It is specially difficult to enforce the legal size limit (taking scallops less than 4 inches in diameter is prohibited) since the bivalves are shucked at sea and only the meats are landed. In the hope of devising an efficient drag that can permit the escape of a high proportion of undersized scallops without reducing the take of legal-sized ones, trials with four different ring sizes were conducted in 1948, but the records have yet to be analyzed.

INLAND FISHERIES, 1948: Production: An estimate of the 1948 inland production indicates that the volume was slightly lower than in 1947, but because of better prices the landed value exceeded that of 1947, according to the March 1949 Trade News of the Canadian Department of Fisheries.

Fish Production of Canadian Inland Waters, 1945-48		1948 (est)	1947 (est)	1946	1945
Quantity	million lbs.	80.0	81.1	95.6	91.7
Value (landed) ..	\$ million	10.4	9.8	10.9	12.1

Exports: Export markets (mostly the United States) absorb about 70 percent of inland production,

and accordingly, fresh-water fish comprised 15.3 percent of the total value of Canadian fishery exports in 1948. Because of the decrease in inland production in 1948, exports (57 million pounds) were slightly lower in quantity, but their value (\$13.7 million) was almost \$1 million higher, than in 1947.

Capitalization and Employment: The capital equipment in fresh-water primary operations (vessels, boats, gear, wharfs, freezers, smoke houses, etc.) was estimated to be worth \$10 million in 1947, while that of the sea fisheries was \$50 million. Operations in Ontario, Manitoba and Saskatchewan were capitalized at \$5 million, \$2 million and \$1 million, respectively. The ratios of capitalization to landed values in inland and sea fisheries are about equal. The fresh-water fishery items that are relatively high in value are shore installations and gear.

The number of persons employed on vessels, boats, etc., either full or part time, was estimated for 1947 to be 18,000 for inland operations and 47,000 in the sea fisheries. However, many of those included as employed in fisheries are laborers, farmer fishermen, fur farmers, etc., who have other incomes and may fish only a limited time each year. This is particularly true in the case of the inland fisheries.

Production by Species: Whitefish and yellow pike have consistently been the predominant inland species produced, in terms of both poundage and landed value.

Ontario Fishery: Ontario had a better year in 1948 than in 1947; production went up from 24.9 million pounds to 26.2 million pounds, and landed value rose from \$4.8 million to \$6.2 million.

The increase in production was chiefly accounted for by the blue pike and whitefish. Ciscos experienced a further drop in production but the landed value per pound had increased considerably over 1947.

Species	1947 (est.)	1946	1945	1944
	... (In millions of lbs.) ...			
Whitefish	16.6	19.2	18.9	17.7
Yellow pike	14.5	13.8	14.8	15.0
Lake trout	5.2	7.3	5.6	5.0
Sauger	4.1	4.9	6.0	6.6
Blue pike	1.8	2.0	6.5	9.4
Ciscos (Lake herring) ..	4.3	11.7	9.4	3.9
Tullibee	13.4	10.5	8.0	6.6
Total Production ...	81.1	95.6	91.7	85.4

It is expected that a large run of blue pike will occur in 1949 as a large year class will have matured to market size. On the other hand, the herring or ciscos have been on a downward cycle. Biological research is being conducted on this problem in Lake Erie. It is thought that once in every so many years there is a large spawn survival followed by a large production as the fish from this spawning mature to market size.

Lake Erie is the most productive area in Ontario. In 1947, it produced 12 million pounds valued at \$2.7 million, almost half of the output of the Province by quantity and value.

Manitoba Fishery: In the Manitoba fishery, there has been concern over the Lake Winnipeg production as the two-month summer season in 1948 was again unsuccessful. Whereas, production in the summer of 1946 had amounted to 2.1 million pounds, in 1947 it only reached 1.2 million pounds, and in 1948 it dropped still further to 1.1 million pounds. As a result, many fishermen suffered substantial losses: the value landed in the 1948 summer season was about \$290,000, whereas, the actual expenses of the fishermen were estimated to be about \$330,000, not including an income allowance for the operators of the 150 whitefish boats which were licensed for this season. The quota of whitefish was 3 million pounds; yellow pike, 150,000 pounds.

The two-month fall season on Lake Winnipeg showed a 15 percent increase in production over that of 1947. There were 1.252 licences (including all help).

The 1948-49 winter fishing was delayed by the late freezing. However, because of a decline in United States demand for frozen fresh-water fish occasioned by large storage carryover from the Fall of 1948 and increased production in American waters, Manitoba and other inland fishermen were faced with the prospect of huge unsold stocks of fish caught during the Winter of 1948-49. The Dominion Government, however, in order to relieve the situation, purchased 5,000,000 pounds of the unsold stocks remaining in fishermen's hands in 1949 at a price which assured a fair return.

In the fall of 1948, 5 of the 12 Lake Winnipeg fish freight boats were equipped with mechanical coolers. They will be of particular advantage in the summer season as the boats have to operate the length of the lake in picking up fish and the distance allows but two runs each week.

Byproducts of the Manitoba filleting operation in the Winnipeg vicinity are mink food, made up into 50-pound frozen cakes, and a meal used in poultry food concentrates. The meal is made by dehydrating the fish remains by the naked-flame process. However, only a small portion of the total waste of the industry is used, for most of the Manitoba fishery is located in remote areas.

Alberta Fishery: The winter production, which constitutes two-thirds of the landed value of the Province, is mainly marketed in the highly preferred fresh form because most of the 69 fished lakes are accessible to the transportation facilities of the agricultural area in which they are located. Although the fishing seasons of these lakes are staggered and stable supplies might be expected, on opening days these small lakes attract large numbers of fishermen and the entire quota may be produced in a few days, creating sudden increases in supply. Though the Alberta production is not large compared to that of the total inland waters, because of its erratic nature, it is closely watched by the trade.

An interesting development on Lesser Slave Lake is the intensive tullibee fishing by the 300 to 400 mink ranchers over the past eight years. Production has risen from 1.3 million pounds in 1945 to 4.5 million pounds in 1948.

Saskatchewan Fishery: The Saskatchewan Government has a pilot plant for fisheries research and has conducted experiments in the pickling, canning, and smoking of its fresh-water fish. Other government activities include an attempt to expand the consumer market within the Province for a small increase in the per capita consumption in Saskatchewan would take care of the total provincial production. Most rural areas in the west are seldom serviced with fresh fish. The mail order business of winter frozen fish to rural communities has met with some success.

Quebec Fishery: Eels, from the St. Lawrence River, the principal species taken in the inland waters of Quebec, are often marketed alive in New York City.

Northwest Territories: The commercial fishing operations of this Territory are limited almost entirely to Great Slave Lake. During the past summer season, this highly productive lake yielded large catches. The record for three-men boats was 111,000 pounds and for two-men boats, 105,000 pounds. The total 1948 summer production (dressed weight) totaled 2,020,000 pounds, mostly lake trout and whitefish.

In spite of the remoteness of this lake, up-to-date filleting and freezing operations are located there. The processing plant is mounted on barges. The fishing boats bring in their catch daily and unload it directly on to the scaling tables where the fish are scaled, filleted, (in the case of whitefish, candled), and

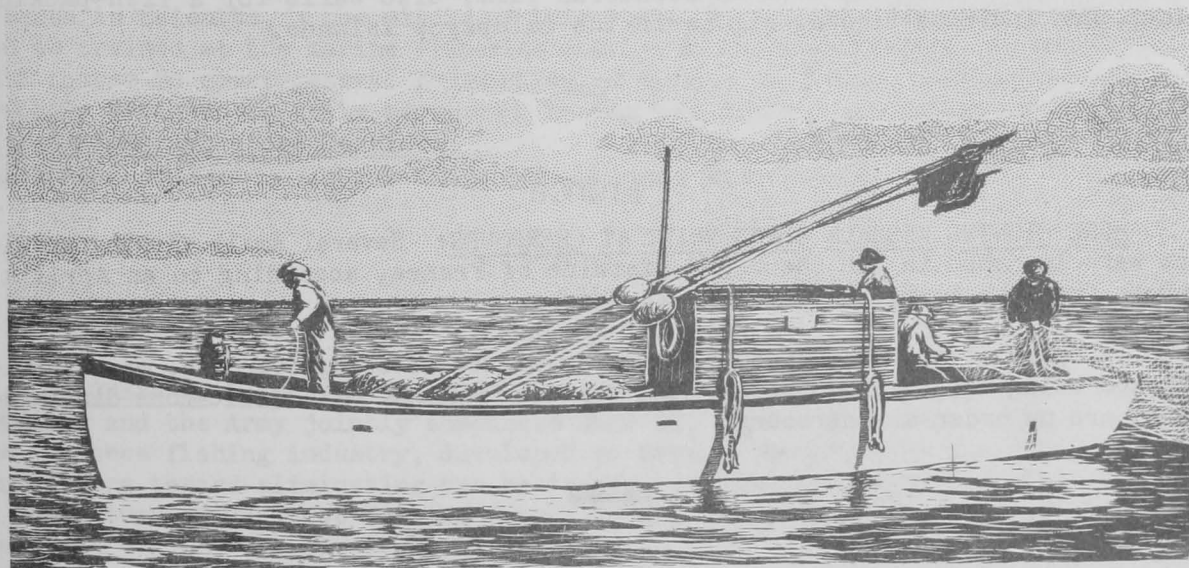
then wrapped in cellophane, packed in cartons and frozen in $3\frac{1}{2}$ hours in pressure-plate freezers. The frozen product is shipped by refrigerated barges to the rail-head at Waterways.

The 1948-49 winter season has seen an increase in fishing activity which to date has been very successful.

Development of the Inland Fisheries: Despite favorable developments in recent years, the inland fisheries are continuing their efforts, especially in planning for the future. Fresh-water fish are sold at relatively high prices, and consequently, they are more vulnerable to general price changes. Attention increasingly directed to the expansion of the domestic market, to the reduction of operating costs through modernization, to the increase of earnings through the utilization of byproducts, to the stabilization of marketing through greater emphasis on quality (assisted by the Department of Fisheries' new system of compulsory pre-shipment inspection of fishery products offered for export from inland provinces), and to the stabilization of production based on scientific research into the possibility of increasing the long-term productivity of inland waters.

Quality: A recent interview with an inland fisherman revealed that watching quality has paid dividends in the form of substantial premiums for his fish. He is punctual in lifting his nets and shipping, and to this end keeps two dog teams in reserve in case his snowmobile breaks down. He segregates the fish into those alive and dead in the net. He packs fish of the same approximate size in each box and marks the number in each box on the outside in blue pencil. He keeps his storage shed at a constant temperature to guard against freezing and deterioration. During the past six winters, the same fisherman has also made a practice of fishing a certain percentage of non-commercial types of coarse fish so that the natural balance in his lake will be preserved.

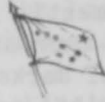
Equipment: One producer and processor on Lake Erie has an unusual method of increasing his return from whitefish. For the past twelve years he has put his



LAKE WINNIPEG WHITEFISH BOAT. TWO MEN AT THE STERN ARE SETTING A NET; A THIRD IS STEERING; MAN IN THE BOW IS TAKING SAMPLES OF THE LAKE BED WITH A LEAD WEIGHT. AT VARIOUS TIMES OF THE YEAR A SAND OR MUD BOTTOM MAY BE DESIRED.

late fall catch from his pound nets into a concrete tank 70 feet long, 45 feet wide and 8 feet deep where he keeps them alive for a period of up to three months. The tank will hold several tons of fish. The whitefish, which are plankton feeders, obtain their food from the water which is pumped in at a rate of 1,000 gallons per minute. Last year the fish were sold in January and February and were reported to be in excellent condition.

Byproducts: One interesting byproduct of a coarse fish, the eel pout or burbot, is liver oil. At Baudette, Minnesota, opposite Rainy River, Ontario, is a plant that refines the oil and makes the product into a capsule which it markets under its own name. These capsules are similar to cod liver oil capsules.



Ecuador

PLANS EXPANSION OF TUNA FISHERY: The Ecuadoran fishing industry was given great impetus in April by the signing of three contracts of industrial protection for the building of factories for fish packing and the utilization of fish by-products, according to a May 2 report from the American Consulate General at Guayaquil. The biggest investment is to be a two-million dollar plant operated by an American company for tuna and tuna-fish paste canning.

Plans are reported ready for building to start within three months in Manglaralto, with production scheduled for April 1950.

A contract was signed also for the same type of factory to be located in Manta, with an American-owned, locally-capitalized firm. This company is to work with an Ecuadoran fishing concern which is building a refrigeration plant in the Galapagos Islands.

A further contract, with an Ecuadoran firm, also calls for a fish-packing plant, and includes fishing rights in the Galapagos Islands.



France

MORE FISHING VESSELS BEING BUILT AT CHERBOURG: Several small fishing trawlers were launched in the Cherbourg district of France, according to an April 14 report from the American Consulate at Cherbourg.

In spite of opinions that fisheries expansion is being overdone, more trawlers are being built. Eight of the latest model trawlers (100 metric-tons displacement) are on order at Cherbourg.



India

GOVERNMENT'S PROGRAM FOR DEVELOPMENT OF FISHERIES: A five-year Government plan for the development of India's fisheries, based on modern methods employed

in Europe and Japan, is now well under way, according to a May 5 report from the American Consulate General at Bombay. This development forms an important weapon in fighting the country's food shortage problem. A target of 10,000 metric tons of fish every day has been set as against the present estimated catch of about 5,000 tons.

The Government's program envisages an exhaustive survey of India's 3,200-mile coastline, the establishment of pilot fishing stations, and the encouragement of deep-sea fishing. This phase of the program, estimated to cost approximately \$6,034,000, is scheduled to be completed in two years. Pilot stations will be established at Saurashtra, Bombay, Cochin, Mandapam (Madras), Vizagapatam, Chandbali and Calcutta. Each of these stations will be equipped with cold storage plants with a capacity of 400 metric tons, and modern trawlers and fishing vessels.

Negotiations are in progress between the Government of India and Japanese authorities for the purchase of fishing vessels for deep-sea operations. An "air blast" type fish freezing plant is stated to have been received from the United States recently.

Arrangements will be made for transporting fish to the interior by refrigerator railway vans, motor trucks, and even by air.

Another feature of the program is the raising of fresh-water fish. The Government has started stocking 340 ponds in the villages of Delhi Province and this program is being extended in all inland waters throughout India.

A comprehensive program to formulate research in Indian fisheries with a view to effect coordination and integration of all research is being worked out. Proposals to extend surveys of culturable waters and to stock all such areas with carp or other suitable species of fish are also proceeding.

The Central Government has selected 25 candidates for the second session in fisheries training in inland fisheries at the Central Fisheries Research Station at Palta in Calcutta, in the middle of this year. A similar batch of students will also be trained at the marine fisheries station at Mandapam (Madras) during a ten-month course to cover general principles of marine fisheries work. These are primarily designed to train personnel to man the fisheries offices in the Subordinate Administrative Services.

Note: Values converted on basis of 1 Indian rupee equals 30.17 cents U. S.



Japan

PROGRESS OF FISHERIES CONSERVATION PROGRAM: The U. S. Departments of State, Interior and the Army jointly announced June 10, that a conservation program for the Japanese fishing industry, developed by General MacArthur's headquarters, is progressing toward eliminating the basis of objections on the part of some nations to the return of Japanese fishing fleets to some portions of their prewar fishing areas.

The program being carried on under General MacArthur as the Supreme Commander for the Allied Powers, calls for the Japanese to maintain surveillance over fishing and other aquatic operations to eliminate excessive exploitation, to collect and

analyze statistical information relating to aquatic life, and to disseminate such information to other interested nations. It also calls for the Japanese to cooperate with other nations in the use of common fishing grounds, and to observe the customary fishing habits of other nations using the same areas.

Japanese fishing since the end of the war has not been authorized outside certain areas, generally in the vicinity of Japan and eastward to the 165th meridian. Japanese fishing operations prior to World War II did not always observe internationally accepted practices, particularly regarding conservation of resources.

The conservation of open-ocean and near-shore resources has been a concern of the SCAP organization from almost the day the occupation began. Progress has already been made in the reorganization and redirection of research for this purpose as well as in making the Japanese conscious of proper fishery conservation methods. The United States considers it important, however, that Japan continue and intensify this program in order to supply in these fields of activity specific assurance of Japanese wish and intention to participate in world affairs in a responsible manner.



Norway

PLANS FLOATING HERRING OIL PLANTS: What may be a new era for the Norwegian fishing industry is forecast in a report from Bergen describing the purchase of a 7,000-ton British landing craft for conversion into Norway's first floating herring oil factory, according to an April 30 report from the Royal Norwegian Information Service. Fishermen and industrialists both in Norway and abroad are watching the experiment with interest, recalling how a similar Norwegian venture 20 years ago initiated the first whaling "factory ship." Until now it has been impossible to exploit many areas rich in fish simply because of their distance from the Norwegian coast. The new development promises to solve this problem.

There are many complications to be met, however, before the factory vessel will be able to operate on the open sea. One of these concerns the method whereby the fish might be hoisted aboard in heavy weather. Conventional clam-shell buckets or grabs could not be used, and might be replaced by large-diameter suction hoses. Another problem is fresh water. Either a large condensing plant must be installed aboard such ships, or a new manufacturing process must be developed.

Backers of this project are confident, however, that these will cause little delay in perfecting the sea-going herring oil factory. Many years of research have already gone into the project.

TO SEARCH FOR "LOST" HERRING SCHOOLS: An indication of the purpose and significance of a research expedition planned for this summer by the Norwegian Fisheries Directorate was made public in Oslo recently by a government specialist, according to an April 23 report from the Royal Norwegian Information Service. The researchers will set out to find one or possibly two "lost year-class groups" of spring herring--herring which are of a quality far superior to those now available to Norwegian fishermen.

The herring is an unusually intractable fish. For a period it may appear in vast quantities, following which it may disappear almost entirely from the Norwegian coast. The last great resurgence of herring has now lasted for almost 40 years, and experts are wondering whether or not another historic recession may not be in the offing. The last marked recession ended in 1904 with a fantastically heavy spawning year, which serves as a basis for the quantities of fish which are being caught off the Norwegian coast at the present time. Age counts of fish caught during these past years show, however, that even though they represent three strong successive year classes the turning point may be near.

It is here that Norwegian scientists hope to offset the anticipated drop by locating the whereabouts of the so-called "lost year-class groups". Hereto it has been possible to follow the development of the herring through each year of its long life-span with the exception of from one to two years when it moves out to sea, disappearing completely. During this period it reaches its peak quality, both in regard to size, meat texture, and fat content. It is during this period, however, that its whereabouts is unknown. Should it be possible for scientists to trace this movement and find the herring in quantities adequate for fishing, it may mean a completely new source of income for the Norwegian fishing industry.

URGES LIFTING BAN ON TRAWLERS: Strong arguments for a modernization of Norwegian fishing methods with increased emphasis on trawler fishing were recently voiced by the Norwegian Fisheries Minister, according to a May 7 report from the Royal Norwegian Information Service.

In view of the present high cost of trawler ships, the Fisheries Minister maintained that the immediate lifting of present restrictions on trawler operation would involve no risk for Norway's fishing industry. A long-range program would have to contend with the fact that poor cod catches for the past two years are turning fishermen toward other occupations, and that a stabilized labor situation in Northern Norway demands a year-around fishing force in contrast to present surges of seasonal occupation and unemployment. "There is no doubt," he maintained, "that thirty or forty thousand men with trawlers could normally produce the same amount of fish as do 120,000 fishermen today."

He added that an over-all change would have to take place in the Norwegian fishing fleet. Larger ocean-going vessels which would be able to fish wherever catches might be found would have to take the place of smaller coastal craft. He made it clear, however, that such a readjustment would have to take place gradually and in consideration of the employment and occupational problems involved.

He further noted that exploratory expeditions are being sent out to find new fishing fields and that an expedition of 65 vessels will soon leave for the rich banks off Greenland. The latter will be accompanied by refrigerator ships with supplies of bait and salt and will be prepared for preliminary on-the-spot processing. A new-type floating trawl recently developed in Denmark was also described as an epoch-making development which would greatly add to the efficiency of Norway's fleet.



Portugal

FISHERIES REVIEW, 1948: Introduction: The fishing industry in Portugal comprises three main fields of activity, according to February 1 and March 10 reports from the American Embassy at Lisbon:

- (1) The coastal fishery--sardines are the most important variety taken, although the local catch also includes substantial quantities of tuna, anchovies, chinchards and mackerel;
- (2) Trawl fishing on the high seas, particularly off the French Moroccan coast--the chief varieties caught are sole, whiting and turbot;
- (3) And the cod fishery of the Newfoundland Grand Banks and west coast of Greenland fished every year by a large, modern fleet of Portuguese schooners and trawlers.

Whale fishing is also conducted on a small scale in the adjacent Islands of the Azores.

Sardine Fishery: The Portuguese sardine fishery and the large domestic canning industry which depends on it constitute one of the country's most important sources of wealth. Some 20,000 fishermen gain their livelihood from the fishery which is exploited by a large number of independent proprietors who supply the boats, nets, fishing tackle and other gear.

PRODUCTION AND FLEET: The 1948 sardine catch amounted to only 47,683 metric tons, or less than half of the approximately 100,000 tons which are normally taken each year (Table 1), and the problems thereby created for the sardine fishing industry were serious. The scarcity of sardines resulted in a virtual doubling of the selling price so that the value of the reduced catch, placed at slightly over \$9 million, represented a small increase over that of the 1947 catch which was approximately twice as large; nevertheless, the greatly increased costs of exploration, which were especially heavy under the scarcity conditions of 1948, more than offset the sales income of most proprietors.

The problems of the sardine fishing industry in obtaining an adequate return on invested capital have been aggravated by a large expansion in the size of the sardine fleet from a total of 268 boats in 1940 to 411 boats in 1948. In addition to the boats, the fleet in 1948 also included 200 auxiliary transport craft and 24 coastal sardine traps. This expansion was not accompanied by any appreciable increase in the size of the annual catches. The Government has acted to limit fishing operations during the coming season and has continued a previous ban on the construction of boats which is expected to result in the gradual return to a

sardine fleet of the prewar size. Abnormally low sardine runs in 1948 have resulted in the revival of proposals that a thorough scientific study of the fishery be undertaken to determine the reasons for the recurring cycles of abundance and scarcity and devise possible remedies.

SARDINE PACK: During the war and after, when shortages of other foodstuffs were widespread, fresh sardines assumed a paramount importance in the popular diet and consumption approximated 60,000 metric tons annually. In 1948, it was reduced to 22,000 tons which sold at inflated prices. Except for a very small quantity put up in brine, the balance (approximately 25,000 tons) was packed for export. This amount, some 14,000 tons less than the quantity processed in 1947, did not permit the industry

to fulfill more than about 35 percent of its foreign contracts for canned sardines. Thus, Portugal was deprived in 1938 of a large portion of the foreign exchange receipts it normally receives from sardine exports.

Table 1 - Portuguese Sardine Catches, 1941-48^{1/}

Year	Quantity	Value
	Metric Tons	U.S. Dollars
1948	47,683	9,166,440
1947	92,929	8,271,320
1946	97,726	11,742,480
1945	109,030	11,331,320
1944	128,221	10,373,000
1943	132,924	12,427,280
1942	81,667	11,811,360
1941	76,486	11,435,640

^{1/}All data apply to continental Portugal only and do not include the relatively unimportant catches in the adjacent islands of the Azores and Madeira.

The domestic sardine pack in 1948 totaled 19,796 metric tons or 989,799 cases (1 case of 100 cans equals 44 pounds), as compared with 31,221 tons or 1,560,324 cases in 1947.

SARDINE EXPORTS: Because of the time lag, the effect of the abnormally low 1948 catch was not reflected in the volume of canned sardines exported during the year which was 68,523,000 pounds (1,557,341 cases), as compared with 59,995,200 pounds (1,363,530 cases) in 1947 (Table 2). The corresponding values were \$18.7 and \$16.4 million, respectively. The United Kingdom, Belgium, Italy and the United States, in that order, were the principal purchasers in 1948, and the United States share was notable, in that it represented the largest quantity ever exported to the American market and was nearly 45 percent over 1947.

Destination	1948 ^{1/}	1947	Average 1939-46	Average 1935-38
(In thousands of lbs.)				
United States	7,345.9	5,066.8	4,335.4	5,255.1
Germany	575.1	265.4	19,144.0	26,092.6
Belgium	18,486.0	34,347.4	3,165.3	6,849.2
United Kingdom	21,605.6	132.1	36,716.9	11,936.2
Netherlands	300.8	3,328.1	666.6	739.9
Switzerland	2,063.5	2,237.2	4,607.6	736.9
Sweden	769.5	1,558.0	880.8	1,431.2
Italy	8,016.0	1,313.0	628.9	2,387.7
France	7.7	9.9	5,057.0	16,620.1
Other Countries ...	9,352.9	11,737.3	6,303.1	12,713.8
Total	68,523.0	59,995.2	81,505.6	84,762.7

^{1/}Because of time lag, effect of abnormally low 1948 catch was not reflected in volume of canned sardines exported in that year. About 52 percent of the 1948 catch was canned.

GEOGRAPHIC EXTENT OF THE FISHERY: Sardine fishing is carried on along the entire coast line of Portugal with the most important fishing areas being within six miles of the shore. The chief fishing centers are Matozinhos and Figueira da Foz in the north; Peniche, Lisbon, and Setubal in the center; and Portimao, Olhao and Vila Real do Santo Antonio in the south. In general, fishing operations are not carried on in depths greater than 328 feet. In the north where the coastal waters are shallow, the 328-foot depth line runs out as far as 20 miles; in the center, particularly in the Lisbon and Setubal area where the ocean floor drops off suddenly to 3,280-foot depths, this line is much closer to the shore, generally within the six-mile limit.

FISHING EQUIPMENT, METHODS, AND SEASONS: Both movable and fixed nets are employed in sardine fishing. By far the greater part of the annual catch is taken in the movable nets which are of two types:

- (1) The large seine net, generally about 2,625 feet long by 230 feet wide and
- (2) The small seine net, ranging from 722 to 984 feet in length by 197 to 295 feet in width.

In 1948, the industry had in use 64 large and 347 small seine nets. The fixed nets, or traps, of which 24 were in operation in 1948, consist of two parts:

- (1) A long net stretched on poles extending out to sea hundreds of feet in a direction perpendicular to the shore and
- (2) A series of nets supported on poles and anchored to the sea bottom which form a rectangle into which the long net leads.

The fish swimming along the coast are diverted by the long net into a small entrance in the rectangular enclosure and are captured when the nets in one section

of the trap are hauled to the surface. Besides these main types, there are other small nets owned by the fishermen which are of minor importance.

The sardine fishing season, April to January, is in part coincidental with the spawning period of the fish (January to June). The fish generally begin to

run in the spring along the Algarve coast in the south; proceed north along the West Coast during the summer; and large schools are usually present in the central region of Setubal-Lisbon-Peniche during July and August. They reach the northern fishing grounds based on Matozinhos in the fall, and fishing operations in that area are pursued intensively during October, November, December and January.



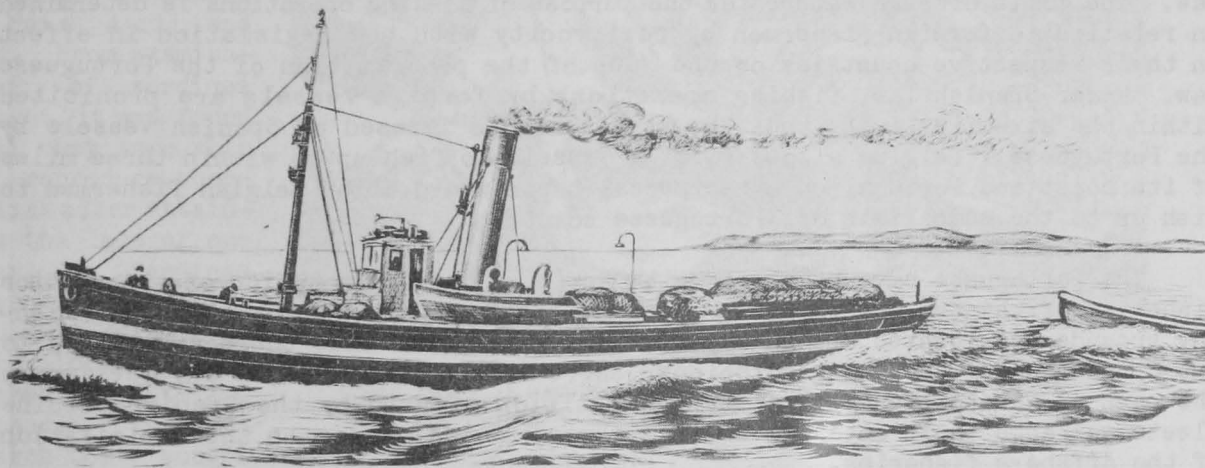
PORTUGAL AND SPAIN SHOWING PRINCIPAL FISHING PORTS.

40 gross metric tons, known as a "galeao," averaging 66 feet in length. These boats burn gas oil or diesel oil and carry a crew of about 20 men. The net, being large and heavy occupies most of the deck space of the "galeao," together with auxiliary gear such as ropes, floats, and leads. Since there is insufficient space in the "galeao" to stow the fish, the mothership is accompanied by 3 or 4 small auxiliary craft for the transport of fish. These carry about four men and are usually motor-propelled.

Sardine fishing is always carried on at night because the shadows of the nets and boats in the water in the daytime would frighten the fish away. The sardine boats customarily leave port in the evening and return at sunrise. Upon arrival at the fishing area selected, which is chosen on the basis of prevailing currents, ocean depth, reports of fish runs, etc., one end of the seine net is cast into the sea by the "galeao" which then describes a large circle, paying out the net by means of winches as it proceeds, until it reaches the original starting point with the other end of the net. The upper edge of the net is supported by floats while the lower edge, weighted with leads, sinks some 230 feet below the surface of the water. The central part of the net, which is strongly reinforced, is then adjusted by means of lines so as to belly out and form a huge bag leading from the two extremities of the net which are kept about 330 feet apart. It is through this opening that the fish enter into the central bag during the period that the net is held in position. After a certain number of hours, the two ends of the net are drawn together, thus closing the bag and entrapping

the fish within. The surface periphery of the net is then gradually closed into a small circle to enable the crews of the auxiliary boats to take the catch. Before the whole operation can be repeated, the net must be re-stowed on the deck of the mothership; generally not more than two catches can be taken on a single expedition.

Fishing with small seine nets is a different type of operation since the nets are not kept in a stationary position in the sea but are towed slowly through the water at a speed of 2 or 3 knots by boats known as "traineras." Operations are confined to areas with sandy bottoms since rocky bottoms would result in damage to the nets. These boats are of about 10 gross tons and usually between 39 to 46 feet in length. They generally burn gas oil and carry a crew of about 12 men. The "traineras" do not require auxiliary boats, having sufficient cargo capacity to transport the fish caught. The nets are dragged through the water until they become heavy with fish when they are pulled into the boat by means of winches and



TYPICAL SARDINE MOTHERSHIP, "GALEAO," (ABOUT 40 GROSS METRIC TONS AND 66 FEET IN LENGTH) USES LARGE SEINE NET WHICH OCCUPIES MOST OF THE DECK SPACE.

emptied. This process may be repeated a number of times during the course of a night's fishing.

CONSERVATION MEASURES: Regulations Applicable to Portuguese: Two long-standing conservation measures enforced by the Portuguese are a prohibition on the taking of sardines of less than 4.3 inches in length, and the requirement that the mesh of sardine nets be not finer than 3.9 inches. The size limit of 4.3 inches has been in effect since 1926; the regulation of the size of nets is a very old one. The fishermen have no particular incentive to take small sardines since they are not utilizable for canning and cannot be transported to interior points for consumption.

Under an order of the Ministry of Marine, issued on July 5, 1948, sardine fishing operations have been made subject to further regulations limiting the dimensions of nets and requiring the mandatory suspension of fishing activities for minimum periods of 15 days each. The time of such suspensions of activity are chosen by the proprietors and the periods may be continuous or alternating on condition that the annual total of suspensions is 60 days for boats up to 39 feet in length and 90 days for boats of a length greater than 39 feet. These new regulations became effective on January 1, 1949 and were issued as a result of recommendations made by the Central Fisheries Commission of the Ministry of Marine.

These recommendations were the result of a careful study of sardine fishing operations from which it was concluded that periodic suspensions of fishing activity would make for more economic exploitation of the fishery.

Restrictions on Foreign Participation in the Fishery: The Spanish are the only other nationality now conducting sardine fishing operations in Portuguese coastal waters. Ordinarily, they confine their activities to the coastal waters adjacent to Spain. However, the Spanish sardine fleets based at Huelva and Cadiz in the south and at Vigo in the north follow the practice of extending their operations to Portuguese coastal waters in the event that fish do not appear in sufficient quantities in Spanish coastal waters. Before the war, the Belgians also fished for sardines off the Portuguese coast and rare appearances were made in local waters by British and French fishermen. However, no fishing by nationalities other than Spanish has occurred in the postwar period.

Foreign fishing operations in Portuguese territorial waters are prohibited by law. The limit of such waters for the purpose of fishing operations is determined in relation to foreign fishermen by reciprocity with the legislation in effect in their respective countries on the date of the proclamation of the Portuguese law. Under Spanish law, fishing operations by foreign vessels are prohibited within the six-mile limit; thus the same limit is imposed on Spanish vessels by the Portuguese. Belgium allows foreign vessels to fish up to within three miles of its coast and Portugal on a reciprocal basis would allow Belgian fishermen to fish up to the same limit off Portuguese coast.

The Portuguese have no accord with Spain on the exploitation of the sardine fisheries of the two countries. Because of the fact that the most important fishing grounds are located within the six-mile limit and since these are barred to the Spanish under present regulations, there does not seem to be any feeling on the part of the Portuguese that the competition offered by the Spanish sardine fleets warrants their entering into an agreement with Spain on the exploitation of the offshore fisheries.

PROBLEMS OF THE INDUSTRY: The chief problem with which the industry has to contend is the uncertain and irregular character of production resulting from the cycles of abundance and scarcity which are such a motable characteristic of the sardine off the Portuguese coast. Therefore, the low sardine catches during 1948 has compelled the Government to give financial assistance to the proprietors in the form of long-term loans.

OUTLOOK: It is doubtful that the internal market can continue to absorb sardines at the rate of 60,000 tons a year, in view of the increasing availability of other foodstuffs. Because of the loss of important prewar European markets, particularly France and Germany (Table 2), the exportation of canned sardines cannot return in future years to the prewar average of 2 million cases per year, corresponding to about 50,000 metric tons. It is believed that 40,000 tons is the maximum quantity which the canning industry can absorb out of a normal production of 100,000 tons annually.

The solution for the utilization of the excess production is an expansion in the quantities of sardines conserved in salt and brine. At the present time, only about 5,000 tons of sardines are put up in brine, principally for export, and a very small quantity dried and salted for public consumption. This type of conservation could be considerably expanded for both the internal and external market

and such expansion would provide a continuous supply of preserved fish for public consumption in Portugal and make possible an increase in exports of this relatively cheap product.

SCIENTIFIC STUDY OF FISHERY: The only previous investigations of the Portuguese sardine fishery were fragmentary studies made in the 1920's which resulted in the assembly of data regarding the location of sardine eggs off the coasts. These tended to establish that reproduction took place throughout the period from January to June and was concentrated in the months of March, April, and May. From examination of sardines caught, it was found that they were able to reproduce themselves after attaining the age of one year. (Sardines have a maximum life of 4-5 years). Eggs were located at a number of points and although the research boats sought them at a consider-



UNLOADING SARDINES FROM THE HOLD OF A SARDINE AUXILIARY CRAFT. SINCE THERE IS INSUFFICIENT SPACE IN THE GALEAO TO HOLD THE FISH, THE MOTHERSHIP IS ACCOMPANIED BY 3 OR 4 SMALL AUXILIARY CRAFT TO TRANSPORT THE SARDINES.

able distance from the shore, in every case they were found not more than 20 miles from land, thus indicating that the spawning does not take place far out at sea. The data gathered was superficial and no positive conclusions could be drawn from it beyond the fact that the eggs discovered were near the shore and were concentrated in the coastal water south of the Tagus River and off the shore of the southernmost province of Algarve.

From the scanty evidence available concerning the reproduction, migratory habits and life cycle of the sardine, most Portuguese fishery experts consider it doubtful whether the intensity of fishing operations has any appreciable effect on the quantity of fish available. The general opinion, although not scientifically substantiated, is that reproduction possibilities of the sardine are much greater than the ability of man to exhaust the supply of fish. An interesting fact observed from a study of Portuguese sardine catches in recent years is that the average size of sardines of a given age has been increasing. This would seem to pose two possible hypothesis:

- (1) Either that the natural conditions under which reproduction took place were unfavorable, with the result that fewer sardines were hatched and those that were grew larger because they had a relatively greater supply of food, or

- (2) That the total sardine population is being reduced by fishing activities and that the existing fish are of larger size than formerly for the same reason as in (1).

The natural conditions prevailing at the time of the sardine's hatching and during the early stages of its life cycle are considered by most authorities as of primary importance in determining the scarcity or abundance of fish in any given year. Almost no information on this subject is available to the local fishing industry. Other matters which merit local scientific study to determine their effect on the movements of the sardine schools are ocean temperatures and currents, winds, and the migrations of the marine organisms on which the sardine feeds.

Tuna and Anchovy Fisheries: Production of tuna and anchovies in 1948 was lower than in 1947. Exports of tuna were greater in 1948 than in 1947 while exports of anchovies were less in 1948 compared to 1947 (Table 3).

Year	PRODUCTION		E X P O R T S			
	Quantity		Quantity		Value	
	1948	1947	1948	1947	1948	1947
	(M.T.)		(M.T.)		(U.S.\$)	
Tuna	1,186	1,600	2,862	1,055	3,200,000	1,200,000
Anchovies ...	2,481	2,503	2,105	3,256	2,800,000	4,300,000

The United States took 70 percent of the 1948 exports of anchovies and was the second most important purchaser of canned tuna after Italy.

Trawl Fisheries: Contrasting with the very poor year experienced in

the coastal fishery, trawling operations yielded a record catch of 42,669 metric tons, valued at \$8.8 million. The 1948 catch represented an increase of 22 percent over that of the previous year which was 34,833 tons, valued at \$6.6 million. In 1948, the number of trawlers in operation was 97, an increase of 10 vessels over 1947.

The results of the 1948 cod campaign were disappointing. According to preliminary figures, the total catch was approximately 28,800 metric tons of fresh cod, which after processing will yield about 20,000 tons of dried cod, or only one-third of the country's annual requirement of 60,000 tons. In 1947, the catch was 33,719 metric tons from which 23,267 tons of dried cod were produced. During the first 10 months of 1948, imports of dried cod, principally from Norway and Newfoundland, totaled 22,000 tons, with a value of approximately \$8,750,000. The prospect is that imports of at least 30,000 tons, valued at \$12 million will be required in 1949 to maintain domestic consumption at a reasonably satisfactory level.

The results of the 1948 campaign were a definite setback to the Portuguese hope that the expanded and modernized cod fishing fleet can achieve the goal of supplying from 60 to 70 percent of the domestic requirement for cod, which is a basic element in the diet of the people. It was the first year since 1944 that the catch failed to exceed that of the previous year and instead dropped 15 percent below that of 1947.

Participating in the 1948 campaign were 48 schooners and 11 trawlers with a total deadweight tonnage of approximately 37,000 metric tons. Four new trawlers were completed during the fall and winter and a total of 15 vessels of this type sailed for the Grand Banks in February 1949 to initiate the 1949 fishing campaign. As of March 1, 1949, there were 8 trawlers under construction in national and

foreign shipyards and destined for incorporation in the Portuguese cod fishing fleet. When these units are completed and enter into service, the fleet will have reached the maximum size (approximately 70 vessels of about 50,000 total dead-weight tons) under the construction program initiated in 1939. No further building is contemplated except for replacements.

Note: Values converted on basis of 1,000 Portuguese escudos equals approximately U.S.\$40.00.



Spanish Morocco

FISHERY INDUSTRIES, 1947: Canning: Fishing is one of the important industries of Spanish Morocco, according to an April 25 report from the American Legation at Tangier. Fishing fleets are located in Larache, Arcila, Alcazarquivir, Rincon de Medik, Rio Martin, Puerto Capaz, Cuatro Torres Alcala, Villa Sanjurjo, and Villa Nador. Absence of any sort of refrigeration makes it impossible to sell fresh fish outside of the port cities.

There are 16 canneries in operation which pack sardines, bonito, and tuna for sale in Spain, the United States, and the countries of Western Europe. Most exports of canned fish to countries other than Spain are made via Tangier. The pack in 1947 totaled 1,928 metric tons valued at approximately \$2,468,343. The canneries are located at Ceuta (7), Larache (3), Villa Sanjurjo (2), Melilla (3), and Castillejos (1). Operators of canneries are hampered by difficulty in obtaining import licenses for such essential items as tinplate. Cannerymen in Ceuta have recently appointed an agent in Tangier to represent them directly to American importers.

Dried and Salted Fish: Salted and dried fish is produced at the ports of Melilla, Villa Sanjurjo, Ceuta, and Larache. The 1947 production totaled 3,494 metric tons valued at approximately \$2,515,197. Most of the dried and salted fish is exported to Spain or sent by trucks to other parts of Spanish Morocco.

WHALING: A whaling station went into operation at Benzu Bay, just west of Ceuta, in September 1947. The first year of operation was quite successful. In the season ending March 1948, 120 whales were taken in the Straits. Norwegian ships and seamen were invited to participate in the first season in order to teach the local fishermen, and they took the major share of the catch. The 1948-49 catch, in which the Norwegians did not participate, is believed to be smaller than for the preceeding year.



Uruguay

DANISH VESSELS AGREE TO FISH FOR URUGUAY: Two Danish cutters with a crew of four men each are on their way to Uruguay in order to fulfill a contract lasting two years, according to the April 16 issue of the British periodical, The Fishing News.

The agreement has been concluded between the fishermen and the Government of Uruguay, which has promised to buy all the fish caught by the Danes. Erection of a Danish canning factory in Uruguay has also been planned.

If the experiments prove successful, a whole fleet of Danish fishing vessels will go to Uruguay in a few years.



Venezuela

NEW DEEP-SEA FISHING VENTURE: A new Venezuelan fishing company composed of Italians has purchased a refrigerated boat in Italy, the Giorgio, equipped for deep-sea fishing, with a crew of 12, and a capacity of 15 tons, according to an April 25 report from the American Embassy at Caracas. This boat is now in La Guaira.

This new company is proposing to exploit a fish called "el calamar," said to be in a class with "pargo," "mero" and "carite." It is claimed that large numbers of these fish have been found in the deep waters near Margarita Island.

The fish are to be packed in boxes of 26 pounds each and covered with ice. It is believed that $1\frac{1}{2}$ metric tons can be handled in two hours.

This company is proposing to supply the Caracas free markets with a metric ton of fish per day to retail at 41 cents per pound with an appreciable margin of profit for the retailers.

A loan of \$36,000 has been asked of the Venezuelan Development Corporation so that the boat can put out to sea.



FISHING INDUSTRY IN BRAZIL

The only commercial freezing units now in operation in Brazil are located in Rio Grande do Sul. Fresh fillets of fish are marketed locally in that state, and frozen fillets are shipped to the populous areas surrounding Sao Paulo and Rio de Janeiro. The volume of this coastwise trade is unknown. Species filleted are Tachysurus barbatus, Paralichthys brasiliensis, Micropogon undulatus, various weakfish, and others

--Fishery Leaflet 329