FOREIGN

International

FOOD AND AGRICULTURE ORGANIZATION

MEETING PLANNED ON FISHING COSTS AND EARNINGS: An International meeting on costs and earnings in fishing is being planned by the Food and Agriculture Organization for the autumn of 1958. It is expected that the meeting will last one week and will probably be held in London.

The meeting will be of direct interest to fishermen, fishing boat owners, processors, and others in the world's fishing industries, as well as to governments and organizations concerned with fisheries. "The meeting will be attended by men with direct experience of keeping track of costs and earnings. We hope that 20 or 30 qualified participants will come from important fishing countries belonging to FAO," states the Chief of the Economic and Statistics Branch, Fisheries Division, FAO.

The great part played today by governments in the maintenance and development of fishing industries, such as through subsidies, credit schemes, tax and duty remissions, price support and marketing schemes, and many others, has made studies of costs and earnings of paramount importance to them.

"The industry is also particularly interested in such studies as a basis for negotiation of contract prices, share agreements, minimum and maximum prices, and other business," the FAO official added.

Governments, agencies, and those sections of the fishing industry sending participants will pay the cost of attendance. FAO will provide the secretariat and consultants and run the meeting. The host government will provide the meeting rooms and facilities.

Interested persons who wish to contribute papers to the meeting should write to the Chief, Economics and Statistics Division, Food and Agricultural Organization, Rome, Italy.

GENERAL AGREEMENT ON TARIFFS AND TRADE

JAPAN SIGNS PROTOCOL: The protocol amending the preamble and parts II and III of the General Agreement on Tariffs and Trade, the protocol amending part I and articles XXIX and XXX, and the protocol of organizational amendments, all three done at Geneva March 10, 1955, were signed by Japan on June 17, 1957. Three similar protocols done at Geneva on December 2, 1955, were also signed by Japan on June 1957.

INTERNATIONAL NORTH PACIFIC FISHERIES COMMISSION

UNITED STATES SECTION MEETS IN SEATTLE: The acute situation in the salmon fisheries of the North Pacific during the 1957 season (when the Japanese took a postwar record catch of red salmon on the high seas while the United States salmon run was extremely disappointing) provided a serious background for examination of preliminary reports on salmon research by the United States Section of the International North Pacific Fisheries Commission at a meeting in Seattle, Wash., September 12-13, 1957.

Scientific data collected during the year was to be pooled with that gathered by Canada and Japan at the annual meeting of the entire Commission in Vancouver, B. C., early in November 1957 for study and action by the international group.

Some of the significant points indicated by preliminary research reports were:

1. Tagging carried out by three vessels along the entire Aleutian Chain is still under way, but about 15,000 tags have been affixed this year. Recoveries cannot be considered complete for at least two years. All returns to date from the 1956 and 1957 red salmon tagging were recovered in North American streams or in the area of the Japanese high-seas fishery.

The few pink salmon tags returned to date were all recovered west of the area of tagging, and none from American streams. Tagged chums were recovered both in Asian and American streams.

2. Studies of the 1957 distribution of salmon in the sea showed a heavy concentration north of the Aleutians and slightly west of the provisional abstention line. It was in this area, not heavily fished in previous seasons, that the Japanese made very large catches in a short period in June.

3. Racial studies based on body measurements, blood types, associated organisms, and scale structure are successfully distinguishing between salmon of Asian and American origin. These studies are based on many thousands of samples collected from known locations on the high seas and on both sides of the Pacific Basin and involve great numbers of precise scientific tests and examinations.

4. Unusual net marks on red salmon entering the Bristol Bay fishery in 1957 were studied by the research staff. Although the evidence was not conclusive, there are indications that these marks were made by gill nets of a smaller mesh size than those used by American fishermen.

The United States Commissioners requested their research staff to complete their analysis of the data for the international meeting, and particularly to examine the degree to which it may show the westerly distribution of stocks of salmon of North American origin in the high seas.

All four United States commissioners attended the section meeting: Milton E. Brooding, San Francisco, chairman; Ross L. Leffler, Assistant Secretary of the Interior, Washington, D. C.; Edward W. Allen, Seattle; and John H. Clawson, Anchorage, Alaska.

Advisory committee members attending included: Lowell Wakefield, Seattle, chairman; Robert Kallenberg, Dillingham, Alaska; George Johansen, W. C. Arnold, DeWitt Gilbert, Harold E. Lokken, Seattle; Clarence L. Anderson, Juneau; Milton C. James and John Hodges, Portland; James Waugh and Donald P. Loker, Terminal Island, Calif.

Officials attending from Washington, D. C., included W. C. Herrington, special assistant for fisheries to the Undersecretary of State, Donald L. McKernan, director, U. S. Bureau of Commercial Fisheries.

Scientific research presentations were directed by Dr. W. F. Thompson, Fisheries Research Institute, University of Washington, and C. E. Atkinson, chief, Pacific Salmon Investigations, Bureau of Commercial Fisheries.

INTERNATIONAL WHALING COMMISSION

UNITED STATES ADHERES TO CONVENTION: The protocol amending the International Whaling Convention of 1946, done in Washington November 19, 1956, was ratified by the President on August 30. The ratification was deposited by the United States on the same date, the U. S. Department of State announced in September 1957. This amendment is not in force as yet.

NORTH PACIFIC FUR SEAL CONVENTION

CANADA AND UNITED STATES DEPOSIT RATIFICATIONS: Both the United States and Canada on September 16, 1957, deposited ratifications to the Interim Convention on Conservation of North Pacific Fur Seals, signed at Washington February 9, 1957. This Convention is not in force yet. (U. S. Department of State Bulletin, October 7, 1957.)

INTERNATIONAL PACIFIC HALIBUT COMMISSION

NORTH PACIFIC HALIBUT AREA 3A CLOSED SEPTEMBER 22: The closure of fishing in Pacific halibut Area 3A took place on September 22 (6 a.m. P.S.T.). The International Pacific Halibut Commission made the announcement on September 4 since it estimated that by September 22 the catch limit of 30 million pounds for Area 3A would have been reached. While last year there was a second fishing season of 9 days in Area 3A, this season the regulations call for only one season since the Commission felt that with the 30-million-pound quota the stocks in that area would be fully utilized in the single season.

The Commission at the same time announced that halibut fishing in Areas 3B and 1A were to continue until 6:00 a.m. (P.S.T.) October 16, 1957. Last year Area 3B closed on the same date as Area 3A and was reopened for 9 days the same as Area

3A. In 1956 the first fishing season in Area 3A and 3B closed on August 24 when the catch limit of 28 million pounds for Area 3A was attained.

The official opening date for all halibut fishing in the Pacific regulatory area this year was May 1 at 6:00 a. m.(P.S.T.). The United States fleet sailed in time to commence fishing on the opening day, but the Canadian fleet did not sale until May 3 and started fishing about 5 days after the United States fleet because of a labor-management dispute over certain fringe benefits and "lay" apportionments. In 1956 the opening date was May 12, but both United States and Canadian fishermen voluntarily agreed not to start fishing until May 20. In 1955 the official opening date was also May 12 and actual fishing started on that date.

This year Area 3A was open to fishing for 144 days--the longest season for this area since 1945 when the area was open to fishing for 147 days. Prior to 1955 the trend had been towards a shorter season, but since that year fishing has been spread over a greater number of days due to a combination of several factors: (1) a decline in the number of vessels fishing for halibut; (2) labor-management disputes; (3) voluntary tie-ups by fishermen; and (4) weather conditions. Prior to this year Areas 3A and 3B opened and closed at the same time. As compared to 144 days for Area 3A this year, Areas 3A and 3B were open for halibut fishing for 104 days in 1956, 81 days in 1955, 58 days in 1954, 52 days (shortest on record) in 1953, 60 days in 1952, 56 days in 1951, 66 days in 1950, 73 days in 1949, and 72 days in 1948.

Areas 2 and 1B were closed to fishing on June 17 when the quota of 26.5 million pounds for Area 2 was attained. A second fishing season in Areas 2 and 1B took place from July 29-August 5.

Under authority of the Convention between Canada and the United States of America for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea, this year's regulations became effective April 10, 1957.

ORGANIZATION FOR TRADE COOPERATION

JAPAN ADHERES TO AGREEMENT: The agreement on the Organization for Trade Cooperation, with annex, done in Geneva March 10, 1955, was signed by Japan on June 17, 1957. This agreement is not in force as yet.

TRADE AGREEMENTS

AUSTRALIA AND JAPAN SIGN NEW TRADE AGREEMENT: A new trade agreement between Australia and Japan, providing for reciprocal most-favored-nation treatment in all matters of trade between the two countries, was signed in Tokyo July 6, 1957, and was made provisionally effective from that date pending the exchange of ratifications.

Imports into Australia from Japan are now admitted at the most-favored-nation rates of duty applying to non-British countries.

Australia

MODERN TRAWLER TO INVESTIGATE FISHERY POTENTIAL OF GREAT AUSTRALIAN BIGHT: In order to investigate the possibility of establishing a commercial fishery in the Great Australian Bight, a modern Diesel trawler of 160 feet or more will be purchased by the Australian Government.

The project will be financed from the Fisheries Development Trust Fund. It was recommended to the Minister for Primary Industry by the Interdepartmental Committee which considers developmental proposals to be financed by the Fund, and was supported by the Western Australian, South Australian, and Victorian representatives at the conference of Commonwealth and State Fisheries officers in Canberra at the end of May 1957. The Victorian delegate emphasized that his State, as a major importer of fish, would welcome increased supplies of fresh fish.

An increase in Australian production of fresh fish has become an urgent need.

In two years (1953/54 to 1955/56) fish landings (excluding crustaceans and molluscs) fell by 18.1 percent. The catch taken by the steam trawlers based at Sydney has fallen in seven years from about 10 million pounds to 3.6 million pounds. Only four trawlers are operating now instead of 12 as formerly.

In 1955/56, Australian landings of fish, crustaceans, and molluscs at 43.8 million pounds (edible weight) was sufficient to provide only the extremely low per capita consumption of 4.7 pounds. A total of 52.5 million pounds of imports, less about 5.5 million pounds of exports, raised this figure to 9.7 pounds. If Australia's population continues to grow at the rate of about 250,000 a year, fish imports will continue to rise unless domestic production is increased.

After careful consideration of the conditions under which any vessel in the Bight must operate, it was recommended that a Diesel trawler of about 160 feet would enable the Bight grounds to be efficiently worked.

One important advantage of a vessel of this size for fishing in the Bight is that it will be able to fish in all but the worst weather, and thus maintain a flow of fish to the markets. This in turn should help to stabilize prices and encourage distributors to expand their handling of the catch on a permanent basis.

The trawling grounds in the Great Australian Bight were discovered in 1912-13 by the Commonwealth investigation ship Endeavour, which was lost with all hands in a storm in December 1941.

In 1949-52 a London-originated commercial venture fished the grounds with two obsolete steam trawlers, using English wartime utility nets that were too small and heavy in construction for Australian fishing conditions. Even under these handicaps, one of the ships averaged 3,222 pounds of fish per day's absence from port and the other 2,594 pounds, compared with 3,000 pounds for Sydney-based trawlers. It may be expected that a modern Diesel trawler will do considerably better.

The catches taken by the two trawlers included three fishes that form the bulk of the southeastern trawl fishery catch--flathead, morwong and nannygai--also red snapper, queen snapper, silver flounder and three types of boarfish. (August 1957 Fisheries Newsletter of the Australian Commonwealth Director of Fisheries.)

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, SEPTEMBER 1957, P. 51.

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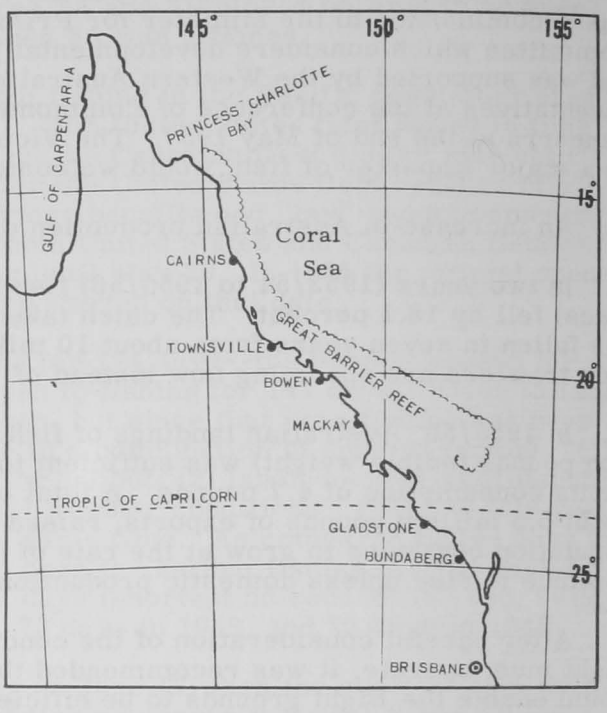
NEW SHRIMP RESOURCE DISCOVERED ON FIRST STAGE OF YEAR'S SURVEY: On the first stage of a survey of shrimp resources in Queensland and northern New South Wales, the Australian Government chartered vessel Challenge located an extensive new ground near Fraser or Great Sandy Island (southern Queensland) between Double Island Point Light and Indian Head. The ground extends from 6 to 20 miles offshore in water up to 35 fathoms and covers an area of about 750 square miles. Large king shrimp (Penaeus plebejus) were predominate, and some tiger shrimp (P. esculentus) were taken, but no banana shrimp (P. merguiensis).

Some fishermen have started to fish the new area.



The survey, which is scheduled for 12 months, is being financed from the Fisheries Development Trust Fund and carried out by the Commonwealth Fisheries Office.

Employed in the survey is Australia's newest and most up-to-date shrimp vessel Challenge, which has been chartered for the full 12 months.

In a press statement announcing the survey, the Australian Minister for Primary Industry said:

"Prawn fishing promises to become the basis for a valuable export trade, mainly with the United States where shrimp are a favorite sea food. In 1955/56 Australia exported about 100,000 pounds of shrimp. By mid-January 1956/57, exports had already reached 206,000 pounds, worth about £70,000 (US$156,000).

"While the United States is by far the biggest market for Australian shrimp, we are also selling small quantities to the United Kingdom, South Africa, and Fiji and other Pacific Islands.

"The known grounds in northern New South Wales and southern Queensland are already being heavily fished and it is most desirable to ascertain the real extent of our shrimp resources.

"The Australian species which brings the highest price in the United States is the banana shrimp, which is fished in waters near Bundaberg. It is considered that the ocean waters within the tropics and near the large Queensland coastal rivers are areas which are most likely to carry shrimp stocks."

The Challenge has been converted into the most modern shrimp vessel in Australia and uses a coil brine tank for immersion freezing. This method appears to produce a better product than conventional freezing, and the product has a longer storage life. Freezing takes place much faster.

The Challenge is 85 ft. by 20 ft. by 7 ft. The engineroom is aft. The main engine is a Diesel twin unit developing 375 hp. at 2,100 r.p.m. It is cooled by a heat exchanger. Independent clutches enable the ship to be run on one of the twin engines if necessary, and each engine has independent electrical starting from four 6-volt, 15-plate batteries which also supply electricity for some of the ship's lighting.

The auxillary engine is a 3-cylinder Diesel developing 80 hp. at 1,850 r.p.m. It is started by two 6-volt, 25-plate batteries and is cooled by a heat exchanger. This engine drives the ammonia compressor ($6\frac{1}{2}$" x $6\frac{1}{2}$" twin), and the main 15 hp. generator which supplies power for driving the winch, brine-tank agitator, brine-circulating pump, forced-draught condenser fans, battery charger, and bilge pump.

A second $6\frac{1}{2}$-hp. generator is driven by the main engine. This generator supplies enough power to drive several but not all of the equipment items mentioned above at the same time.

The winch and gallows are aft of the deckhouse. The winch is electrically driven through a double worm drive gear box, giving independently operated drums.

The freezing and packing chamber is 20 ft. by 10 ft. by 6 ft. The ammonia-coil-brine-immersion tank, which is made of heavy galvanized iron, is 6 ft. 6 in. by 3 ft. 6 in. by 4 ft. 6 in., and the actual immersion area is 4 ft. by 3 ft. by 1 ft.--large enough to hold four 50-pound galvanized wire baskets of whole shrimp. The brine is circulated by an electrically-driven, 3-bladed, 9-inch diameter propeller turning at 720 r.p.m. Temperature can be held at 0° F.

The holding room is 21 ft. by 13 ft. by 8 ft. It is insulated for 0° F. temperature and is cooled by a 3-fan (16-inch diameter) forced-draught condenser. Brine from the freezing tank is circulated through the unit by an electrically-driven 1-inch pump. The holding room is loaded through a port at the after end and an insulated hatch is provided in the deckhead for discharging. All drainage from both the holding and freezing rooms goes into a sump, so none can find its way into the bilge.

The Challenge has bunk accommodation for 5 in the forecastle and 1 in the wheelhouse, and two berths can be fitted if necessary in the wings amidships. There is seating for 8 in the messroom.

The fresh-water tank holds 250 gallons and the fuel tank 867 gallons. Cruising consumption of 10 gallons per hour gives the vessel a range of about 700 miles.

Equipment includes a transreceiver and an echosounder.

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, OCTOBER 1957, P. 24, AND SEPTEMBER 1957, P. 60.

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PEARL-SHELL OPERATIONS OFF AUSTRALIAN COAST BY JAPANESE IN 1957: Japanese pearl-shell fishermen operated off the northern coast of Australia during the 1957 season under an arrangement made by the Australian Commonwealth Government--but in order to conserve pearl-shell resources limits were placed this year on their activities in certain areas.

The Japanese operated again this year under the Provisional Regime set up by the Governments of Australia and Japan. This is a temporary arrangement concluded in 1954 pending a decision by the International Court of Justice on Japan's challenge to the validity in International Law of the Australian Pearl Fisheries Act 1952/53.

Arrangements for the 1957 season were substantially the same as those in force in 1956. The number of pearling vessels approved was the same and the greater part of the Japanese operations took place off the Northern Territory.

"In the interests of conserving pearl-shell resources two areas were closed to all pearling and an upper limit was placed on the quantities of shell permitted to be taken by the Japanese in two other areas north of Arnhem Land.

Permission was again given to the Japanese to operate in two areas off the northwest coast of Western Australia, and also to take a limited quantity of shell from an area southwest of Broome. The areas to the west of Torres Strait, made available in 1956, were slightly enlarged this year.

The prohibition against the Japanese operating within 10 miles of the Australian mainland or of an inhabited island was continued. The Japanese were required to comply with all requirements of Australian legislation, including the taking out of licenses, furnishing of production data, and close supervision.

The Commonwealth Government's survey of Australian pearl-shell resources, started in 1956 and suspended during the summer months, was to be resumed as soon as the weather permitted the survey vessel to operate. The survey is expected to provide the information on which effective conservation measures (in the long-term interests of the pearling industry) would be based, states an April 10, 1957, dispatch from United States Embassy in Canberra.

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TUNA RESOURCES OFF WESTERN AUSTRALIA: The Australian Minister of Fisheries informed a member of the Legislative Council of the Western Australia Parliament that a survey of the commercial resources in the seas off the North-west and the Kimberley coast of Australia show that at least two species of tuna occur in great quantities. The survey under way for several years found that northern bluefin tuna (Neothunnus tonggol) and mackerel or little tuna (Euthynnus alletteratus) occur over a considerable area off these coasts. Other species of tuna, namely yellowfin (Neothunnus macropterus), striped tuna (Katsuwonus pelamis), and dogtooth tuna (Gymnosarda nuda) are found in lesser quantities in these waters.

The fishermen in the above areas are interested in exploiting the tuna resources if a market could be found in the United States. If a market could be found, a modern tuna clipper would be purchased with suitable facilities to freeze the catch for export.

Brazil

JAPANESE VESSELS LAND FISH AT SANTOS: After 12 days at sea, three of the Japanese fishing vessels, Tokai Maru 33, Akashi Maru 33, and Akashi Maru 35, arrived back at Santos, Brazil, on September 12 with a total catch of 90 metric tons. The fourth vessel, the Tokai Maru 35, was expected to unload its cargo of 30 metric tons at Rio de Janeiro.

The company organized to handle the boats has requested the municipal authorities for permission to install 10 distribution stands in various sections of the City of Sao Paulo. Since this permission had not yet been granted, only half of the catch was sent to Sao Paulo and the remainder was stored in a refrigerated warehouse at Santos.

Because of the large amount of fish available, it had been expected that the price would drop sharply. As this did not occur, the press interviewed the head of the Fish and Game Section of the State Secretariate of Agriculture. He said the explanation was that the fish went through the regular wholesale trade, because the permission to install stands for sales directly to the public had not yet been granted by the municipal authorities. (United States consular dispatch from Sao Paulo dated September 18, 1957.)

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JOINT FISHING VENTURE WITH JAPANESE OPPOSED BY FISHING VESSEL OWNERS: The arrival of the first four of six Japanese fishing vessels at the port of Santos on August 16, 1957, resulted in a protest by the Association of Fishing Vessel Owners of the Brazilian State of Sao Paulo. The arrival of the Japanese vessels marked the initiation of the agreement between the Brazilian Government and a large Japanese fishing company for permission to fish in the territorial waters of Brazil. The Association's protest to Brazil's President and the Ministry of Agriculture claimed that the Japanese firm had received "special privileges." The

Government in answer to this protest on the part of the vessel owners stated that not only were no special privileges involved, but that the arrival of the Japanese vessels augured well for the more efficient use of one of Brazil's important natural resources.

The agreement reached on July 24, 1957, between the Brazilian Government and the Japanese firm included a plan to put a fleet of small trawlers into operation immediately with the possibility of later building fish-processing plants and a shipyard in Santos for the overhauling, repair, and possible construction of fishing craft. The signing of the agreement resulted in the formation of a subsidiary in Brazil. Two additional Japanese trawlers are due to arrive to implement the first phase of the joint venture.

At the present time the Japanese subsidiary firm "Pescados Oceania do Brasil," is a small distributing organization with over 50 percent of the capital stock owned by the Japanese firm and with the minority stock Brazilian, but largely subscribed to by members of Brazil's substantial Japanese colony. This distributing organization plans to enter into retail sales by opening their own retail outlets, first in Sao Paulo and then in other important cities of the area. It is probable that the fishing vessels will remain Japanese flag boats for the duration of the contract period. In the meantime, steps are being taken to establish a processing company to freeze fish, and process fish into meal and oil. It is reported that the capital structure of the company will be similar to that of the distributing company and that perhaps the same stockholders will participate. Upon completion of the 2- to 3-year agreement, the Japanese flag vessels will become Brazilian flag vessels and will, it is understood, become a part of the Japanese capital investment in the newly-formed processing company. The agreement also specifies that the Japanese will leave Brazilian waters if at the end of the contract period they have not made an arrangement to have the fishing boats become Brazilian flag vessels. It was also reported that while the Japanese company has provided in the contract that a small percentage of profits and/or capital may be repatriated to Japan, the early operations are not expected to produce any profits; and it is the intention of the parent company not to withdraw capital at first, but to re-invest any profits and if necessary provide additional capital during the formative years of the company's existence.

The new fishing company has opened offices in Santos and is planning to open a preliminary sales office in Sao Paulo very shortly, starting with a capitalization of Cr$10,000,000 (about US$132,000), largely in the form of the fishing boats supplied by the Japanese company. The initial fleet of six deep-sea trawlers are expected to be fully equipped to undertake a wide variety of deep-sea fishing. Two of the vessels which have arrived have a 200-ton hold capacity, while the other two are considerably smaller with a hold capacity of only 50 tons. In addition, steps are actually being undertaken to construct the first refrigerated warehouse at Santos, and it is planned to order from Japan in the near future the necessary processing equipment. With the first small fleet, the officers of the Japanese subsidiary company estimate an annual catch of about 20,000 long tons. Officials estimate the total consumption of fish in Brazil at over 1,000,000 tons, and that present operations of the Japanese fleet will not seriously affect Brazil's consumption of fish, the size of the over-all fish harvest, or its distribution. However, it was revealed that the company intends to sharply undersell current wholesale prices of fresh fish, perhaps reducing the price to as much as one-third of the present landed price in either Santos or Sao Paulo. A figure of an estimated landed price of Cr$10 a kilogram (about 6 U. S. cents a pound) was mentioned. This is in comparison to a current price of Cr$35 a kilogram average (about 21 U. S. cents a pound).

At the present time there are no indications that the Japanese company plans to export any of its processed products in the near future. It was, however, reported that the processing company, which is to be formed in the near future, may build a canning factory and thus prepare for possible future export (U. S. Consulate in Sao Paulo dispatch dated August 23, 1957).

NOTE: 1. ALSO SEE COMMERCIAL FISHERIES REVIEW, NOVEMBER 1957 P. 49, OCTOBER 1957 P. 24.
2. VALUES CONVERTED AT THE RATE OF ONE CRUZEIRO EQUALS US$0.0132.

Canada

EXTENT OF NEW SCALLOP GROUNDS ON ST. PIERRE BANK LARGER THAN REPORTED: The extent of the larger scallop beds on St. Pierre Bank, discovered in July by scientists of the Fisheries Research Board of Canada, are larger than an earlier report indicated. The larger of the two beds is roughly rectangular and covers about 70 square miles (previously reported as 12 square miles). Its center is at 45°34' N. latitude, 56°02' W. longitude and runs about NNW. and SSE. magnetic for 14 miles and is about five miles wide in 24-26 fathoms. Several catches were made in this area of 15-25 bushels of whole scallops per 30-minute tow. The shells averaged almost 5 inches in diameter and the scallop meats were large and firm.

Sea Scallop
(PECTEN MAGELLANICUS)

The smaller of the two beds lies about 15 miles north magnetic from the larger bed. It is about 4 square miles in area and has its center at 45°44' N. latitude, 56°09' W. longitude in 25-26 fathoms. Yields from this bed were from 11-15 bushels of whole scallops per 30-minute tow. The scallops were slightly larger than those from the larger bed and had high-quality scallop meats.

Large numbers of small scallops were found both on the newly-discovered beds and in the area west of the old bed (discovered in 1954) on the northern part of St. Pierre Bank. The presence of the small scallops indicate good fishing in all three areas for 1959 and 1960. (Trade News, August 1957, Canadian Department of Fisheries.)

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, NOVEMBER 1957, P. 50.

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INSULATION FROM EEL GRASS: In Shelburne County on the south shore of Nova Scotia, Canada, there is a plant which manufactures insulation from eel grass. This grass, a form of seaweed, is common along the coast of North America and very plentiful in southwest Nova Scotia. Eel grass has a number of natural qualities that make it suitable for insulation: (1) it will not burn or rot; chemically it contains silica, salt, and iodine; (2) each blade of the grayish black material holds millions of minute air cells; this also makes it valuable as a sound deadener.

Eel grass grows from 6 to 10 feet underwater offshore. It breaks off and floats shoreward. During the summer months men gather it up in dories in shallow water, bring it ashore, and dry it in the open fields. The price paid varies from $21 to $30 a ton, depending on the distance the grass must be hauled to the plant at Sable River. (Maine Coast Fisherman, December 1956).

Chile

JAPANESE APPLICATION FOR INVESTMENT IN WHALING INDUSTRY: The application of a large Japanese fishing company for authorization to import into Chile a million dollars worth of equipment and capital for investment in Pesquera del Sur was approved by the Chilean Foreign Investments Committee on June 5, 1957. To finalize this action the Minister of Finance and the President must each sign this approved application, indicating their separate approval and application must then be submitted to the Comptroller General for his approval. Once these three concurrences have been obtained, the foreign investor may proceed with the importation under the specific conditions laid down by the Foreign Investments Committee when it issued its statement of approval. If one of the three approvals just listed is withheld, the application must be returned to the Committee for further consideration, an August 6, 1957 dispatch from the United States Embassy in Santiago reports.

In the case of the Japanese application, once the Committee has issued its approval on June 5, no further official action was taken until approximately the middle of July. During this interim period, both the opponents and proponents of this investment continued to give voice to their respective arguments for and against the investment which had all been advanced during the period when the application was being considered by the Foreign Investments Committee.

In general, the arguments against the authorization of this proposed investment were advanced by (1) Chilean private fishing interests and (2) the majority of other business interests in Chile. Their arguments followed these lines: (1) the whaling industry is being adequately exploited now and the introduction of more personnel and equipment would be detrimental; (2) Japanese whaling methods differ considerably from Chilean methods, in that they are crude--they will reduce the available stock in a few years and the industry will gradually disappear; (3) the Japanese plan is, in effect, a cover for the Japanese Immigration Department's plan to send large numbers of Japanese, with their families, to settle in Chile; (4) it is inadvisable to permit a foreign firm to install its headquarters just across a rather narrow bay from Chile's most important naval base; (5) the authorization to the Japanese company constitutes a violation of the Chile-Peru-Ecuador Agreement for the protection of the resources of the South Pacific, which forbids the establishment of land-whaling stations within 250 miles of one already established.

Advocates of the investment, mainly Chilean Government officials, argue in general as follows: (1) the introduction of new foreign capital into Chile is a worthwhile goal in itself; (2) the Chilean whaling industry would benefit by foreign competition; the field has not been adequately explored because a few individuals have been able to dominate this industry in Chile.

On or about July 15, 1957, both the Minister of Defense and the President signed the decree authorizing this importation of capital, and the decree was forwarded to the Comptroller General for the final act which would constitute acceptance or rejection of the proposal. To date no statement has been issued by the Comptroller General. The matter has been discussed by industry, by the Ministry of Agriculture, and on the floor of the Chamber of Deputies. In the Chamber a strong case was made against this investment and the recommendation was made that, if necessary, a special Session of Congress be called to review the subject in detail.

Colombia

NEW REGULATIONS RELATING TO THE FISHING INDUSTRY: On September 1, 1957, the study of maritime fauna and the regulation and approval of fishing licenses was transferred from the jurisdiction of the Ministry of War to the Ministry of Agriculture. In addition, fishing in Colombian territorial waters will henceforth be permitted only by ships operating under the Colombian flag or by foreign vessels operating under contract with firms domiciled in Colombia.

The resolution was the result of a conference held by fishing industrialists with the Minister of Agriculture on August 27, 1957. The industrialists also asked for the creation of a National Fisheries Office, expansion of credit facilities, and importation and distribution of fishing implements through the "Caja Agraria." Officials of the Ministry of Agriculture state that these requests are currently under study, points out a September 11, 1957, United States Embassy dispatch from Bogota.

Cuba

OFFICIAL STATES VIEWS ON THE "LAW OF THE SEA": The August 22, 1957, issue of the Havana daily newspaper Excelsior published an interview with the Special Adviser to the Cuban Ministry of State on legal matters on the subject of territorial waters, the continental shelf, the high-seas fisheries, and related matters. The Special Adviser is a member of the United Nations International Law Commission and Cuba's representative on the Inter-American Council of Jurists.

In the interview, the Special Adviser reiterated the position which Cuba has been following in the United Nations and the Organization of American States on these matters. He reaffirmed Cuba's adherence to the three-mile limit of territorial waters, basing this stand on the traditional rights of states to engage in fishing on the high seas. With respect to the continental shelf, he pointed out that there was general

agreement on the proposition that the coastal state has "exclusive and sovereign rights . . .over the resources found in the seabed and subsoil of the continental shelf, or insular or other submarine areas adjacent to its territory." He went on to point out, however, that no such unanimity exists with respect to waters over the continental shelf. In response to a query regarding the depletion of certain species of fish, he called attention to the desirability of continuing to meet this problem through cooperation among states interested in the fishery, rather than through unilateral action by the coastal state.

In reply to a question regarding freedom of the seas and nuclear experiments and referring to the possibility that this subject might arise at the forthcoming United Nations Conference on the Law of the Sea in Geneva in 1958, he stated: "Of course in case of a debate on this question it would first have to be determined to what extent this charge (the danger of contamination of the waters by radioactivity) can be scientifically proven, given that among the rights guaranteed all states under the principle of freedom of the sea is that of making scientific experiments on the oceans. The question is also important because the experiments which are currently being conducted can likewise be directed toward making progress in the peaceful uses of atomic energy."

Denmark

FISH CONSUMPTION DECREASING: At a meeting held in Odense, Denmark, on August 19, 1957, by the National Organization of the Danish Fish Retailers, it was stated that the annual consumption of fish per capita in 1956 was only 12 kilograms (about 26.5 pounds) compared to 14 kilograms (about 30.9 pounds) in 1955, a decline in total consumption of 9 million kilograms (19.8 million pounds).

The Danish Minister of Fisheries, who attended the meeting, recommended that a publicity campaign be launched to promote fish consumption. Another fisheries official expressed the opinion that the decrease in consumption of fish was due to the fact that the National Organization of Fishery Propaganda had stopped its publicity campaign. The former Minister of Fisheries was of the same opinion and suggested that a new publicity campaign be started.

Statistics for 1956 indicate an over-all increase in meat consumption in Denmark of 6 percent over the preceding year, states an August 27 dispatch from the United States Embassy in Copenhagen.

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SEAL SKIN AUCTION BRINGS HIGHER PRICES: The entire lot of seal skins brought up for auction in Copenhagen by the Royal Greenland Trade Department was sold at prices averaging approximately 6 percent over those obtained at the 1956 auction.

Included in the September 3, 1957, auction were 24,588 ringed-seal skins and 619 harp-seal skins. Total sales amounted to 1.8 million crowns (US$261,000), slightly more than expected.

Several foreign buyers were present at the auction, although none directly from the United States. American interests, however, were undoubtedly represented by local commission agents. Principal traditional markets for Greenland seal skins are the United Kingdom and West Germany. (United States Embassy, Copenhagen.)

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VIEWS ON FISHERY TRADE AND COMMON MARKET PLANS: At the annual meeting of the Danish Fishery Trade and Deep Sea Fishing Association held on August 28, 1957 its chairman expressed some rather concrete viewpoints with regard to the effect on the Danish fishery situation of participation in one of the proposed common market plans.

He indirectly supported Danish participation in the European Common Market by stating that Danish fish exports to West Germany and Italy would be endangered if Denmark did not join, and by noting that membership would open the promising French market to greatly increased exports and offer the possibility of regaining the Belgian market. He also maintained that the Danish fisheries would not be injured by increased imports, because of Denmark's favorable competitive position.

With regard to the free-trade area, he stated that Danish participation would not erase the presently existing British duty of 10 percent.

He held that the enactment of a Nordic Customs Union would carry with it improved conditions for the Danish fisheries but would be catastrophic for the Danish canned fish industry. (On this point he undoubtedly referred to the expected domination of this market by Norwegian canned fish.)

In closing he joined an increasing number of Danish economic spokesmen by expressing his opinion that the plan for a Nordic Customs Union had lost practically all actuality since the inception of plans for either a European Common Market or free-trade area. (United States Embassy dispatch from Copenhagen, September 6, 1957.)

El Salvador

REVIEW OF THE FISHERIES: El Salvador's fishing industry, despite its important potential, is very poorly developed. Aside from an unknown number of canoe fishermen, there are only four sizable fishing boats in operation, the largest of which is capable of bringing in perhaps a million pounds a year, and there are only two very small ice plants to furnish the ice which is absolutely necessary for handling fish in a warm climate.

There are no statistics to show the quantity of fish landed in El Salvador; none are kept officially covering the four fishing boats, and there is, of course, no way of totaling the catch of numerous canoe fishermen. Perhaps the catch of the four large boats is 2.5 million pounds a year of fish and 250,000 pounds of shrimp. The fish are of several varieties, bearing local names which are not always subject to translation into English, but the best from the point of view of flavor are "boca colorada" and California corvina. Both of these, when obtained fresh and cooked properly, are very tasty.

The value of the catch at the dockside is usually calculated at 30 centavos (14 U.S. cents) a pound for fish and at 1.25 colones (50 U.S. cents) a pound for shrimp.

The catching, distributing and marketing of the fish is done in a primitive manner. The four fishing boats discharge their catch at small piers at La Union in the Gulf of Fonseca. They necessarily carry a certain amount of ice in their holds, but the quantity is generally found by experts to be far too little. At the dock, the fish or shrimp are weighed--often in the sun--and packed in 100-pound boxes with crushed ice (again usually in insufficient quantities). The boxes are then transported to inland cities and delivered to markets and fish stores. A disproportionately large quantity of the fish has spoiled during this procedure, owing entirely to the use of insufficient ice.

The Government's policies and programs have been for the most part directed toward the regulation of the fish industry. There are elaborate requirements for licenses, for fishing enterprises, and even for single embarkations for fishing purposes. These are set forth in the Government's Decree 1961 of October 25, 1955, which consisted of a fisheries law, and Decree No. 77 of September 12, 1956, which contained the regulations implementing the previous decree. Of significance to foreigners is the fact that while the fisheries law (Decree 1961) stated in its Article 17 that foreigners would be allowed to fish, at least for bait (anchoveta), in El Salvadoran waters, provided they had a license, the regulations which the law stated would be forthcoming have yet to be promulgated, and foreign boats now fish at their own risk.

The Government's industrial development corporation (INSAFOP) has made a survey of a potential fishing industry but has yet to find funds to establish one. There is in effect an industrial processing law, which was designed to encourage

investment in new industries, and which would grant incentive tax concessions to such a new industry if it were founded.

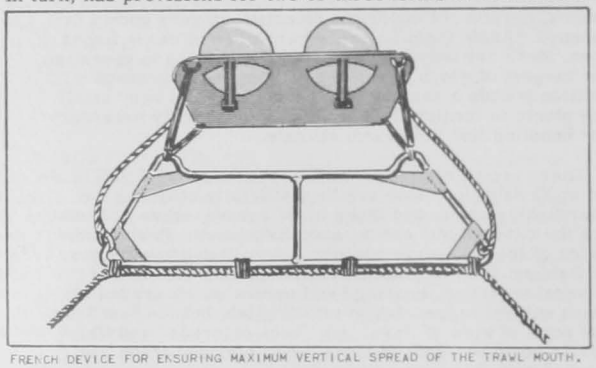
The potentialities of the shrimp fishing industry are good. The shrimp caught in El Salvador is considered to be of good quality, and there is no doubt that it could find a ready market if there were vessels for catching it and facilities for packing it in the proper manner.

France

DEVICE TO KEEP OTTER TRAWL OPEN: How to keep a trawl mouth open vertically without increasing the drag effect has been a problem for a long time. It has been solved, it is claimed, by a Frenchman of St. Malo, who has patented and put on the market a device now on sale in the principal ports of France.

According to latest information heavy sales are being made to French owners, and an English firm has taken up English rights.

Called the "Exocet," it is in effect a framework which carries a rectangular panel at an angle of 30 degrees and which, in turn, has provisions for two or three floats of conventional



FRENCH DEVICE FOR ENSURING MAXIMUM VERTICAL SPREAD OF THE TRAWL MOUTH.

design. This, it is claimed, entirely obviates the objection to the ordinary method of holding the trawl mouth open with floats (whether glass or metal) with which it is found that at about 3 knots the resistance set up against forward movement is greater than their rising force so that the opening is diminished instead of being made larger.

The French technician was faced with the problem of how to produce something sufficiently simple and light, with the least obstacle to easy handling, yet still solid and able to hold its essential position in the water and having the greatest possible lift. He solved these by using an aluminum alloy in the form of a rectangle with rounded corners, reinforced round the edges with flanges, and having provision for floats near the leading edge.

It is fixed directly to the headline at the top of the trawl so that the rectangular part is held at an angle of 30 degrees from the horizontal. It is then found that the rising force increases pro rata to the speed of trawling as the mouth of the trawl is forced open by the force of the water against the inclined plane. Catches are thereby increased as the mouth of the net is enlarged, and a ground can be fished effectively at much higher speed. The risk of tearing the net is also reduced.

The effect of the apparatus, it is claimed by the French interests, is constant under any trawling condition. It has been used by trawlers of all types and proved itself on the grounds. The framework is so designed as to permit the rectangular plate to oscillate freely so that its transverse equilibrium is held. The floats are fixed by special "feet" or cramps which permit easy replacement in case of damage. Their placing is important too, as it insures that the net takes its proper form as soon as it is cast and holds its position should the trawler be stationary or change direction during trawling operations, and prevents any possibility of reversing, alleged to be a major defect in some other devices.

The hydrodynamic form itself is responsible for lowering the resistance to progress. In effect, the pressure on the back of the plate literally forces the mouth of the trawl forward and upwards, forming an arc of which the cod end is the center.

The rising or lifting force is claimed to be greatest at the moment when the trawl is open and is at a maximum in the vertical plane while the opening, fixed as it is right at the center of the trawl mouth, is such as to permit that it is widest where the fish enter. In other words, it has the same effect in a vertical plane as the otter boards have in the horizontal plane.

Three models have been made, differing only in size, the numbers referring to the length in centimeters at the edge. Exocet 80, intended for the largest trawlers with powerful engines; Model 70, for large speedy trawlers fishing for fairly heavy catches and also for the smaller vessels with less powerful motors; Model 60 for the small trawlers or those using small trawls. The latter takes two instead of three floats.

An English visitor to St. Malo saw demonstrations which gave satisfactory results at $3\frac{1}{2}$ knots. British trawlers customarily work at a higher speed, but it is claimed that adaptions permit equally satisfactory results at those speeds. (The Fishing News, August 23, 1957.)

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PLASTIC FISH BOX DEVELOPED: A new type of fish box has been developed in France for handling fragile fish, such as sardine. The box is made of polyester, reinforced with fiber-glass. It is 500 mm. (19.6 in.) long, 400 mm. (15.7 in.) wide, and 100 mm. (3.9 in.) or 70 mm. ($2\frac{3}{4}$ in.) deep. It weighs 1 kg. (2.2 pounds) and the sides are perforated with round holes. The box floats on sea water. These boxes can be piled up without crushing the fish, they are very strong, acid- and alkali-resistant, and can be used for brining, washing, and cooking the fish. (La Revue de la Conserve, March 1957.

Iceland

POLISH CREWS FOR FISHING TRAWLERS PROPOSED: Independent Icelandic skippers are eager to employ some Polish crews for their trawlers during the white fish season, the August 16 issue of The Fishing News points out. The Icelandic manpower deficit is put at 3,000 men. The Icelandic trawler owners have made the employment offer official, and it is almost certain to be accepted by Poland.

The rates offered are £120 (US$336) a month for deckhands with experience. Up to 70 percent of the pay would be available for transfer to Poland.

Since Poland is also short of experienced white fish catchers, Icelanders propose to take several dozen graduates of Polish fisheries schools for practical experience on Icelandic trawlers.

According to Polish sources, the visit to Reykjavik of the Polish fisheries training trawler Jan Turleiski has occasioned keen interest in Icelandic trawler circles. She is a steam trawler, and Icelanders are willing to buy one or more for their fishing fleet. Talks now being conducted include employment of Polish crews.

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SUMMER HERRING FISHERY A FAILURE: The summer herring season with purse seines off the north and east coasts of Iceland has failed for the 13th successive year. The 230 vessels taking part provided 653,000 barrels and crans (about 392 pounds) compared with 512,000 last year by 187 vessels.

The season can be called a moderate failure, which means the Icelandic Government will have to distribute large sums to compensate the fishermen.

Although the total catch was higher, much of it was unsuitable for salting, the herring being less fat than usual. Half a million crans went to factories, 140,000 barrels were salted, and 13,000 barrels were frozen.

There is keen disappointment because it was expected that the larger number of vessels of 25 to 150 tons and including five vessels with big purse nets, would enable the fishery to approach its wartime record. Fewer and smaller vessels caught over a million crans in 1944.

Fishermen know the unpredictable behavior of the herring. They point out that since 1944, when the lean seasons began, there has been a succession of good seasons off the west coast of Norway. Markings have shown a close connection and migration habits between Iceland's summer herring and Norway's winter stocks.

The theory has been that if the Norwegians get good winter herring, the next summer season off Iceland will be poor. Last winter, however, the herring season off Norway was poor, but the expectation that as a result the herring would come to the northern coast of Iceland was not fulfilled.

In August the herring went east and the Icelandic vessels pursued them for 150 miles, much farther than usual. Towards the end of August the vessels returned to begin drift-net fishing off the south and west coasts, while some of the bigger vessels of around 100 tons sought more herring between Iceland and the Faroes. (The Fishing News, August 30, 1957.)

Italy

NATIONAL FISHING INSTITUTE OPENED: A National Fishing Institute has been opened in Italy, with the aim of instructing fishermen in the best fishing methods and techniques. The Institute receives a subsidy from the Government, according to the July 1957 World Fishing.

Japan

FISHERY SURVEYS OFF BRAZIL AND DOMINICAN REPUBLIC: The Toko Maru, a fisheries trawler-type patrol ship (1,110 tons gross) belonging to the Japanese Fisheries Agency, returned to Tokyo July 25, 1957, after completing a 9-months' around-the-world voyage in the course of which surveys were made of fishing grounds off Brazil and the Dominican Republic. The scientific party aboard was headed by the Director of the Nankai Regional Fishery Research Laboratory, an outstanding authority on tunas and spearfishes.

Brazilian Surveys: In view of the topography of Brazilian waters, the surveys were carried out in three steps: (1) the southern part of the continental shelf, (2) the tuna long-lining grounds off the eastern part, and (3) the northern part of the continental shelf (vicinity of the mouth of the Amazon River).

(1) Grounds of the Southern Part of the Continental Shelf:

The area of the continental shelf south of 22° S. latitude is about 83,000 square miles. The continental shelf extends to depths of about 150 meters, beyond which the bottom falls off steeply. From the latter part of December to the middle of March, 67 2-hour trawl hauls were made and observations were made on coastal migratory fishes (sardines, mackerel-scad, etc.). During this period, 85 oceanographic stations were occupied.

The results of the trawling survey were: (a) Catches were larger in shallow water and in the south, tended to be smaller in deeper water and toward the north. In waters deeper than 40-50 meters there were rarely indications of potentially-profitable fishing. (b) In general, the fishes which were always most abundant in the catches were small sharks and many species of rays. The market value of these fish is low. (c) The fish of high market value--pescada, corvina, and other sciaenids--were generally abundant in shallow water. (d) The number of different species captured was about 160, fewer than expected. (e) The bottom was good, and of the 67 hauls, only one resulted in a torn net. (f) There was always some wind and sea, but never enough to interfere with fishing.

These results indicate that it would be more profitable to fish this area with small boats rather than with large vessels. However, the survey was made during the middle of the Southern Hemisphere summer, and it may be thought possible that different results would be obtained in winter.

In the survey of coastal migratory fishes, the sonic fish-finder and nightlights were used. There was a high frequency of traces of schools on the fish-finder, particularly in shallow water. The sardine is one of Brazil's most important fishes, but within the scope of this survey no indication of phototaxis was seen; and the fish could not be taken with the nightlight. It was thought that it would be effective to locate the fish by echo-ranging and then use a round-haul net, but this could not be tried because the Toko Maru was not equipped for this type of fishing.

(2) Tuna Long-Lining Grounds off the Eastern Area:

From about 22° S. north to the vicinity of the Amazon's mouth there are coral reefs along the coast, and the prospects for coastal fisheries are slight, so a tuna long-lining survey was made. Long lines were fished 13 times, and during this period 29 oceanographic stations were occupied. The stations were distributed north and south at 50 to 300 miles off the coast. The results were briefly as follows: (a) Catch rates (number of fish caught per 100 hooks fished) ranged from a low of 2.5 to a high of 20, or in terms of weight of a day's catch, from 700 pounds to an estimated maximum of 5,500 pounds. (b) A fishing ground boundary was found at about 4° S., where there was also a sharp change in oceanographic structure. North of the boundary yellowfin were the most abundant tuna in the catch, while south of it albacore were the main species. Quite a few bluefin tuna turned up in the vicinity of the boundary. (c) The northern limit of the northern yellowfin grounds was not made clear by the present survey. Albacore fishing appeared to fall off to the southward, but fair catches were still being maintained at 22° S. (d) Few sharks were caught, and shark damage to the catch was less than in the Indian or Pacific oceans. (e) There were steady force 3 winds, mainly from the northeast, which were not thought to be such as to hamper the operations of a regular long-liner.

In general the area can probably be said to be a superior tuna long-line fishing ground. Since the grounds are close to the coast, it is thought that it would be both possible and profitable to fish them with small vessels.

The scale of long-line fishing on this survey was held down to about one-eighth that of a commercial boat, but it is estimated that the catch per day for a regular long-liner would be 3-5 tons on the albacore grounds, or 10-15 tons on the yellowfin grounds.

It is difficult to form any definitive ideas of the structure of the South Atlantic tuna grounds as a whole, because of inadequate data, but (1) the different current systems form different habitats, and have different characteristics as fishing grounds, and (2) within a given current system the geographical differences in the character of the fishing grounds appear gradually, except where affected by the topography, and sharp changes, like those between current systems, do not appear. If this theory is admitted, the areas of each of the major currents, such as the South Equatorial and the Equatorial Countercurrent, each have their own different characters as fishing grounds, and they will preserve such characteristics as are referred to in (b) and (c) above as we follow them offshore to the eastward, with only gradual changes in fishing ground characteristics within the current systems.

In terms of distance to the fishing grounds, it will be most advantageous to base in such port cities of the northeast as Salvador, Recife, and Fortaleza, whereas southern cities like Rio and Santos are better from the point of view of markets and bait supply.

(3) Fishing Grounds of the Northern Continental Shelf (Around the Mouth of the Amazon):

In this region the continental shelf extends to depths of around 100 meters, with an area of around 73,000 square miles. The bottom is generally covered with coral and rock reefs and is rough, with the echo sounder showing saw-toothed traces, the "teeth" being mostly 2-3 meters high. This condition is especially marked south of the river mouth, being somewhat ameliorated north of the river, where there are accumulations of mud. Around the river mouth, silt makes the ground unfit for trawling. Near the Guiana border there are some rather extensive areas suitable for trawling. During the the period of the survey there were constant northeast winds of around force 3, and the current ran strongly northwest.

Hauls were made at first at the planned station positions, but so many nets were torn that it was judged difficult to complete a comprehensive survey in this way, and it was decided

to use echo-sounding and oceanographic observations to find places to fish. By this system 13 1-hour hauls were made, with trouble developing on only 6 of them. At the same time, 63 oceanographic stations were occupied.

Because of the topography, this area offers little possibility of large-scale trawling by big ships. The fish taken were not such as to attract attention, and it appeared that the strong currents would in many cases interfere with operations. It appears to offer some possibilities as a shrimp ground, but because of the type of bottom, it is thought that operations by small vessels would be more advantageous than the use of large ships. However, without a great deal of experience on the grounds, operation would probably be difficult.

Dominican Republic Surveys: Survey work in waters of the Dominican Republic comprised 1 trawl haul (net torn), 5 hauls with a shrimp net, and 6 long-line sets, with 23 oceanographic stations occupied during the period. Because of the topography, there was thought to be little to be hoped for from the coastal fisheries, and results of the survey confirmed this belief. The area is thought to be fairly promising as a tuna long-lining ground. Within the scope of the survey, it was judged that the Caribbean side is mainly a yellowfin ground and the Atlantic side principally an albacore and spearfish ground. There were constant northeast winds of about force 3, which hampered operations of the small fishing boat used for long-lining but which would not bother a regular long-line vessel. Since the grounds are close in, operation by smaller vessels is probably quite possible. (Nippon Suisan Shimbun, Japanese periodical, July 31, 1957.)

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FROZEN TUNA EXPORTS TO THE UNITED STATES: Japanese exports of frozen tuna for the first six months of 1957 to the United States amounted to about 53.5 million pounds as compared with 46.3 million pounds for the same period in 1956. The

Japanese Exports of Frozen Tuna to United States, January-June 1957 and 1956, and 12 Months 1956 and 1955

Species	January-June 1957			January-June 1956			12 Months 1956		12 Months 1955	
	Quantity	Value	Declared Value Per Ton	Quantity	Value	Declared Value Per Ton	Quantity	Value	Quantity	Value
	Metric Tons	US$ 1,000	US$	Metric Tons	US$ 1,000	US$	Metric Tons	US$ 1,000	Metric Tons	US$ 1,000
Exports to U. S.:										
Albacore	13,558	4,297	316.89	8,554	3,329	387.81	16,480	6,475	1/	1/
Yellowfin	10,540	2,808	266.41	12,092	3,060	253.06	22,824	5,666	1/	1/
Bluefin	9	2	-	-	-	-	-	-	1/	1/
Other tuna	187	42	251.50	305	78	255.74	511	121	1/	1/
Total exported to U.S.	24,274	7,149	294.51	20,981	6,467	308.23	39,815	12,262	55,091	17,564
Total exported to all countries	29,895	8,647	289.25	26,893	7,752	290.41	51,870	15,496	64,657	19,877
	%	%	%	%	%	%	%	%	%	%
Percentage exported to U. S.	81.2	82.7	-	83.4	81.2	-	76.8	79.1	85.2	88.4

1/ Not available by species.

declared export value of the frozen tuna exports to the United States in the first six months of 1957 of US$7,149,000 was 10.5 percent higher than the January-June 1956 value of US$6,467,000.

Exports to the United States accounted for 81.2 percent of the total quantity of frozen tuna exported to all countries in the first six months of 1957. The average declared value of US$317 a metric ton for frozen albacore tuna exported to the United States in the first six months of 1957 reflected the weaker American market for the species. For the comparable period in 1956, albacore tuna exported to the United States averaged US$388 a ton. (U. S. Embassy in Tokyo dispatch dated July 31, 1957.)

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GOOD SKIPJACK FISHING OFF NORTHEASTERN HONSHU: With a market boundary between warm and cold currents 180 to 300 miles off the Japanese province of Kinkazan (northeastern Honshu), the skipjack tuna schools are lingering in that vicinity. Landings at the port of Kesennuma July 1-25 were 3,500 metric tons from 98 boats with a boat value of US$390,600. If the albacore landed since May are added, tuna landings at this port amounted to 5,140 tons, worth $638,300, or 30 percent of the value of all fishery landings in Miyagi Prefecture. It is expected that if the cold-water mass retreats or disappears, the schools will come in closer to Kesennuma and that landings will exceed last year's record of 14,042 tons.

Since the changeover from albacore to skipjack fishing in July, the average tuna trip has brought in about 36 tons, worth $4,113. With an average price of $111 a metric ton, this is unprecedentedly good fishing. Trips are running about 10 days, and trip expenses for large boats are about $1,944, so even though the price is low, the operators are all cheerful. The skipjack rush is being aggressively led by the canners and driers, who are consuming 70 percent of the landings. Dried skipjack stick production is particularly active, with groups of part-time producers in the picture along with the regular processors, and it is anticipated that production will reach 8,000 barrels, 1,000 barrels more than in normal years.

Deliveries at the Kesennuma fish market have been good since June, and especially during July when landings of all types of fishery products averaged $27,700 a day.

The skipjack live-bait fleet supplied about 50 percent of the value of the landings at the port, and the rest was supplied by seiners, long-liners, trap fishing, salmon gill-netting, salmon trout long-lining, harpoon boats, and small hand-liners, all enjoying a summer peak season. Tuna seining, which had been slow since the middle of July, picked up again. With the various types of salmon boats ending their operations, and with the "skipjack rush" in full swing, it was expected that the period from the last of July through the early part of August would be the busiest of the year at the port of Kesennuma. (Nippon Suisan Shimbun, July 31, 1957.)

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TUNA LONG-LINE FISHING GEAR AND METHODS: Introduction: The Japanese tuna long-line fishery began its development in the early 19th century in central Japan for the capture of the bluefin tuna migrating along the Japanese Pacific coast. In this fishery, high-priced (in Japan) large fish could be taken with a small amount of capital equipment and the operation of the gear was simple, so the number of fishermen using this method gradually increased. Then, with the development of shipbuilding techniques and the internal combustion engine, the radius of operations was expanded until at present the fishing grounds take in almost the whole world, and the catch comprises all such species as yellowfin tuna, big-eyed tuna, and the spearfishes, which inhabit the middle depths of 100-150 meters (330-500 feet).

However, the main gear of this fishery, the long line, has undergone no radical improvement in the past 200 years. The development of the fishery has been supported only by the increase in the number of units of gear employed and the exploitation of new fishing grounds. If there is any element in the fishing gear which has brought about a great advance in this fishery, it is the invention of the line-hauler. This device made it possible to use more than 3 times as much gear as when hauling by hand and brought about a rapid increase in catching power. There has, however, been no improvement in catching power through any essential improvement of the gear, and under present conditions the fishery is maintained in operation by the heavy labor and low pay of its fishermen. Recently more distant fishing grounds are being exploited, with a consequent necessary increase in the size of the vessels, and thus the cost of production has risen steeply, so that the great problem for this fishery from now on will be how to improve the gear and devise efficient methods of fishing it. I wish, therefore, to center my discussion around this point, in order to discover where there is room for improvement of this type of gear and this fishing method and to seek out the direction of progress and development.

The Construction of Tuna Long Lines: It is believed impossible to capture by seining, trawling, or other such methods tunas which swim at depths of 100-150 meters (330-500 feet). This means that hook-and-line gear must be used, and for this the tuna long line has the efficiency of multiple hooks and the capability of landing large fish. At present this gear varies somewhat in dimensions and in weight of the line and wire of which it is made, according to the species fished, but since it is all the same in principle, we will discuss the construction of the long lines in general use.

This gear is made up of main lines, branch lines, swivels, seizing wire, wire, hooks, float lines, floats, flags, and light buoys, but for the sake of simplifying its operation, 5-6 pieces of main line, 4-6 branch lines, and 1 floatline are taken as a unit or one skate.

LINE: Up to the present time cotton line (20-count 50-55 thread 3 x 3) treated with coal tar has been used, but synthetic fibres such as nylon and vinylon have appeared on the scene, and since it has been proved that their useful life is far longer than that of natural fibers and that they are far superior in tensile strength and resistance to abrasion, they have made astonishing progress despite their high cost, because they can satisfy the demand for fineness of line, which is the essence of hook-and-line fishing.

There remain, however, a number of unsolved problems in the application of these materials to fishing gear, such as specific gravity, coloration, and so forth, but they are being solved one after another by fishing gear specialists, so that the changeover of all the gear to synthetic fibers is probably only a matter of time.

FLOATS: Glass balls are used as floats, but their greatest shortcoming is that when they are broken by some external force during use, the float becomes a sinker and carries the gear down, so that in the worst cases it becomes impossible to haul the lines in. Therefore substitutes are being experimentally manufactured out of aluminum, vinyl, polyethylene, rubber, and other materials, however, so far the problems of water pressure and cost have kept them from taking the place of glass balls.

LEADER WIRE AND SEIZING WIRE: At present galvanized No. 27 wire (diameter 0.42 mm. 3 x 3) is used. Its tensile strength is 180 kg. (396 pounds). This is an important element in the construction of hook-and-line gear, and if it were possible, the use of a clear, colorless material like nylon gut would improve catches, but there is no such material which would give the 180-kg. tensile strength for the same thickness of line. If there were some material which even though opaque could give the same tensile strength with less bulk, it would probably replace the wire.

The seizing wire is No. 27 wire served with No. 4 or 5 vinylon or cotton, but this is being replaced with small-diameter nylon line.

ACTION OF GEAR IN THE WATER: When gear of the construction outlined above is set in the sea, its basic form (with no wind or current) is probably a catenary. That is, with branch lines at 50-meter (164-feet) intervals and a total mainline length of 300 meters (almost 1,000 feet), the depth of the hooks is determined by the number of feet of distance within which the unit of gear is set.

If it were possible to detect with a fish finder the depth at which the schools of fish were swimming (there is as yet no fish finder manufactured in Japan which can pick up individual tuna), the proper setting interval could be decided by applying the direction and force of the current and wind to this basic curve.

In actuality, however, it is extremely difficult to set the line so as to maintain a definite depth, and the gear has a complex form, because of the angle at which it is set in relation to the wind and current and because of differences between surface and mid-level currents, which push the gear one way or the other. Particularly when the wind and current are running in contrary directions and are strong, the fishing depth cannot be reached and catches are poor. Captains of long experience can judge such situations and set their gear accordingly.

Where chemical tubes have been attached to the lines to measure the depth of the gear and at the same time the wind and current speed and direction have been measured to calculate the degree to which the lines are streamed out, the calculated results have in many cases not agreed with the actual measurements, but this is probably because of differences between the surface and deeper currents. However, if the lines are streamed out to some extent by the current, while maintaining an appropriate depth, they take on the form of trolling gear, and this is probably the ideal situation.

According to past catch records, the branch line in the middle of the main line produces the highest catch rates. Other lines which stream out in the same direction as the main line are interfered with by the latter, and their catch rates are thereby lowered. Consequently, there is a need for a high degree of expertness on the part of the captain in deciding on the direction in which to set his gear in accordance with the prevailing sea conditions, and this is one of the greatest drawbacks of this type of gear.

If it were possible to detect the depth at which the fish sought were actually swimming at the time, and if the depth at which the gear was hanging could be accurately known, or if the depth of the gear could be easily and quickly adjusted, there would naturally be a great and sudden increase in the effectiveness of this gear, but at present no such improvements are being carried out.

SELECTING FISHING GROUNDS AND TRACKING THE SCHOOLS: The most reliable basis for selection of fishing grounds is that of ascertaining the actual presence of fish, that is, sighting them at the surface or detecting them under the water with a fish finder. However, we do not at present have any device capable of detecting tunas swimming at mid-depths, so right now the selection of tuna fishing grounds is done as follows:

There are statistical data for the approximate selection of fishing grounds, however, the systematic compilation of effective statistical information has been carried only for the past 2 or 3 years and it is still inadequate. Therefore, in most cases the role of statistical data is filled by each individual's experience or by reports heard from other fishermen. What is known is known in only an extremely approximate way, and the concrete question of where to set gear, in the absence of reports from other boats, can be answered only after arriving in the area and giving it a try. As more sharply-focused methods of fishing ground selection, such things as water temperature, water color, currents, bottom topography, birds, and radio reports of other boats are studied closely for several days preceding the vessel's arrival in the area of operation, and if records or memories of experience on the ground are available, they are referred to. As far as water temperature is concerned, almost all tuna boats take surface temperatures, but very few of them measure the temperature of the middle depths. For estimating the depth of the schools, however, determination of mid-depth temperatures supplies powerful data. To take only the surface temperature and then judge that a particular area contains a zone of water suitable for the occurrence of tunas and spearfishes is to jump to conclusions (although of course it may be of some value as an indicator). The significance of continuous measurements of surface temperature is rather to detect changes and thus discover current boundaries. The reason for this is that the tunas, other than those resident on shoals, often tend to accumulate on one side of a surface of contact between different water masses. Consequently, it must be noted that a rapid grasp of the pattern of ocean currents in the area will be reflected directly in the amount of the catch. As for water color and transparency, if we take into account the development of plankton, it is natural that an area with water color of 3-4 on Forel's scale and low transparency should be a better fishing ground than an area with water color of 1-2 and high transparency; however, places with very bad water color are said, on the other hand, to produce poor catches. This is because the occurrence of large numbers of fish and the catching of large numbers of fish are different matters, particularly in the case of hook-and-line gear. This can be granted, I think, if we consider such matters as feeding reaction and range of visibility. Ocean currents, as stated earlier, have an important significance. It is especially essential to get a firm grasp of their boundaries. For this reason the captains of tuna boats go to much trouble dropping drift bottles and following them for hours, using current direction and velocity meters, and checking their drift by celestial navigation in order to get an accurate knowledge of ocean currents and tidal currents.

Location of fishing grounds by the bottom topography and in relation to islands is often done, and since this places the ground firmly in a definite area, once a good ground is discovered, the boat has only to return to the same position again. This is therefore the easiest method of fishing ground selection. It can, however, easily give rise to loss of gear, danger to the vessel, and problems of territorial waters, so it requires minute care in ship handling and fishing operations. Sea birds are an important indicator, . . . and . . . it is said that tuna are certain to be present in areas where many birds are flying.

Putting all of these things together, the tactical selection of the fishing ground is made, but since the gear is not set on the basis of sightings of tuna schools, it probably rarely happens that the schools are encountered on the first set. If the fishermen take a certain point as a center and set their gear in different directions from it over a period of 4 or 5 days, they will be able to judge the sea conditions and the fishing conditions over an area about 70 miles square, and if they then work gradually in the direction that seems most promising, they will end up making a section of observations across an area of about 150 miles. If while searching in this manner they encounter the schools, they begin to follow them. However, with this type of gear this pursuit of the schools is a most difficult and tricky business. If it were possible to track the schools with certainty, it would be unnecessary to make sets of 400 skates of gear over a distance of 35-40 miles, as is the practice at present, and this would be a radical improvement in the fishing method, but there is as yet no certain method for tracking the schools. The simplest method of following

the schools is to set the gear again at the geographical location where the catch was best on the previous day's set, and by repeating this process to get an estimate of the situation. This is the method used on resident fish or when it is not possible to figure out the direction of movement of the schools. Another method is to hypothesize that the larger fish precede or head the movements of the schools and that the fish move against the current while feeding and are carried with the current while resting; by this method the direction of movement of the schools is judged by the size of the fish taken, the location of capture, and the direction and speed of the current. This method fits comparatively well in the case of schooling migratory tunas, but it still presents many doubtful points. Another clue to the size and direction of movement of the school is to take the changes in catch rates along the various parts of the set as a measure of the density of the school, since the density of a school becomes lower toward its rear. Whether the fish are found alive or dead on the lines can also similarly play an important role in deducing the direction of movement and the location of a school.

METHOD OF USING THE GEAR AND THE FISHERMEN'S LABOR: In discussing the method of using this gear, explanation of the details will be omitted, and the discussion will take up mainly the handling of the vessel.

When the boat is hove-to on what, by the methods outlined in the preceding section, is estimated to be a good ground, the setting of the lines is begun around 3 o'clock in the morning. This is because the feeding reaction of fishes is most pronounced at such times as sunrise and sunset, at the change of the tidal current, or when sea or weather conditions change. Line setting is done in accordance with the factors mentioned earlier. Once the line is set, it is left to soak for 2 or 3 hours, and then line hauling is begun. With expert hands this operation is carried on at the rate of about 4 minutes per basket. At this time great skill in handling the boat is required; when the weather is bad, it is especially difficult and great demands are made on the engine, which is often the cause of breakdowns. Furthermore, the expertness or lack of it in this operation has a bearing on the working life of the long lines, and on the occurrence of mainline breaks and the loss of hooked fish. An experienced crew will not leave off fishing or cut down the amount of gear fished up to wind forces of about 5.

About 19 men are required in setting the gear. The boat steams at 8-9 knots while the line is set from the stern, setting being finished in about 4-5 hours. The speed of setting is related to the depth of the gear. Line hauling is done using all hands. The hauling of the lines requires 12-14 hours, and when there are line breaks or the catch is heavy, the work frequently continues through the night. Once line hauling is completed, setting starts again after 1 or 2 hours.

When fishing is poor, boats sometimes keep on operating for as long as 40 days.

The working hours of the crew are 6 hours for line setting, and 13 hours for hauling, a total of 19 hours, and if 1 hour is added for meals and so forth, about 3 or 4 hours are left for sleep. As such labor is done continuously, the fishermen are terribly fatigued by the end of a trip, and frequently their health is damaged. Consequently, men can engage in this work only up to about the age of 40.

The compensation for this labor averages 29,000 yen (US$80) a month, and when taxes and cost of working clothes are subtracted, this leaves a monthly income of 25,000 yen ($70). The captain receives 3 times as much as an ordinary fisherman and the chief engineer about 2.5 times as much.

In 1956 the average monthly income of regularly-employed workers in Japan was 20,669 yen ($57), and for miners the figure was 20,465 yen (less than $57). By comparison the pay of tuna long-line fishermen is very low in view of their working conditions.

In foreign countries the income of maritime workers is generally considered to be about twice that of workers ashore, but the Japanese fisheries are peculiar in this respect, and this is one of the problems to be faced in the future.

BUSINESS CHARACTERISTICS OF THE TUNA LONG-LINE FISHERY: Next I will take up briefly the peculiarities of tuna fishing as a business.

After World War II Japan was very short of food, particularly animal protein, and the government took special financial and other measures for the promotion and protection of the fisheries, especially the tuna fishery, which was regarded as an alternative to the North Pacific salmon fisheries and the Antarctic whaling. As a result the number of operators engaged in this fishery increased by leaps and bounds, but this has brought about declining prices and at present it is by no means a profitable fishery.

Let us look at the actual situation of a 350-ton vessel in 1956. This boat was completed in August 1953 at a cost of 78 million yen (US$216,000), and by the time she was ready to begin fishing the cost was up to 82 million yen (US$227,000). This boat made four trips in the 446 days between November 9, 1955, and January 28, 1957. Total trip time was 375 days, and 71 days were spent in port. The total value of the catch during this period was 59,753,265 yen ($165,981), which averages out to 306 yen per kan ($227 a metric ton). During this time expenditures totaled 70,586,874 yen ($196,075), leaving a deficit of 10,833,609 yen ($30,009).

This vessel operated without any trouble, and fish prices received were slightly higher than the 1956 national average of 304 yen ($227 a metric ton).

It is clear that under these conditions this fishery has no future, and it can be seen that we must try to maintain the fishery by broadening the market for tuna, by getting the price of fish up to around 350 yen per kan ($257 a ton), and by shortening trip time through raising the efficiency of the gear.

From the fact that fuel cost is 67.1 percent of operating expenses, it can be seen how greatly the distance to the grounds has increased, and it can also be seen that cutting down the fuel cost might be one way to stabilize this fishery. Therefore it can be said that the unavoidable fate of this fishery is to change to mothership-type operations or to operations based in foreign countries. However, for these types

Japanese Operating Costs of a 350-ton Long-liner in 1956	
Market charges	$ 8,503.50
Fishing gear	6,424.40
Fuel cost	30,081.50
Expendables (ice, bait, vessel equipment)	8,328.70
Provisions	4,156.10
Improvements to vessel	31,268.70
Repairs	9,766.40
Fishermen's pay	39,248.60
Insurance	14,065.00
Vessel amortization	37,637.90
Taxes and public charges	2,733.70
Business expenses ashore	3,409.40
Miscellaneous expenses	450.80
Total	$196,074.70

of operations much capital is required, and the natural result will be for the industry to be absorbed by big capitalists. This problem is one that is already with us, for such capitalists already have three mothership-type fleets in operation and foreign bases are being used in American Samoa, at Recife in Brazil, at Colombo in Ceylon, and elsewhere.

OUTLOOK: The foregoing is a general account of the tuna long-line fishery. From the standpoint of fishing gear development, there is room for study to determine to what extent the operation of the gear can be simplified, but in view of the essential character of hook-and-line gear, there will probably be no fundamental change in the long line.

In the United States at present they are using snaps and removing the branch lines from the main line, putting 10 branch lines on each basket, reeling in the main lines on drums, and so forth. These changes are being studied in Japan, but have not as yet been put into actual use. After all, this gear and the fishing method have been handed down as a traditional skill for 300 years, and although there have been partial improvements during that period based on experience, there has been no scientific study combining the knowledge of oceanography, ichthyology, and gear materials technology.

At this time, when the food preferences of the world's peoples are shifting from meat to fish, there is bound to be an increase in the consumption of fish in all nations, and there is a high possibility that this fishing method will be developed in various foreign countries as a way of capturing deep-swimming tunas. In Japan the fishery is faced with business difficulties because of the effect of the distance to the fishing grounds on the cost of production and because of the failure

of fish prices to balance these costs, but if this fishery is operated in other countries, it can be a very promising enterprise because of the short distance to the grounds, provided adequate shore facilities can be installed and ways can be found to maintain the price of fish.

However, if tuna long-lining is adopted as a commercial fishery in foreign countries, the problem will be to adapt the gear so that it can be efficiently used by foreign fishermen, just as foreign systems of fishing introduced into Japan have been revised so as to make them easy for Japanese to use.

--BY MITSUO NAGAI, DIRECTOR, KANAGAWA PREFECTURE FISHERIES EXPERIMENT STATION, TUNA FISHING, NO. 42, 1957, PP. 27-32. TRANSLATED FROM JAPANESE BY W. G. VAN CAMPEN.

Mexico

PACIFIC COAST SHRIMP FISHERIES TRENDS, THIRD QUARTER 1957: After a closed season of two months (May and June), it took some time for the shrimp fishing industry on the Mexican west coast to get back into normal production. For the states of Sonora (includes the important port of Guaymas) and Sinaloa (includes the ports of Topolobampo and Mazatlan), July, August, and September shrimp fishing was only fair as compared with past seasons, when the average trip was about 4,400 pounds as against 900-1,500 pounds a trip during this quarter. There was an increase in ex-vessel prices during the quarter.

The industry is reported to have defeated an attempt to impose a longer closed season in the spring. In 1958 the closed seasons will move from spring to summer.

A new all-Mexican distributing group has been established in San Diego. It includes Guaymas and Topolobampo representation and is expected to effect great savings by direct marketing. The improved railway service now available will soon be used instead of trucks for shipments out of Mazatlan with a reduction in shipping costs. A new ice plant has been completed in Mazatlan and a new freezer is being constructed.

The industry is reported eager to establish an institute on the west coast of Mexico for the scientific study of shrimp migrations and plans to ask the assistance of a private and independent United States organization to conduct the research.

A survey predicts good but not heavy shrimp fishing for the coming season in the bays of Southern Sonora and off Sinaloa. Fishing prospects offshore have not proved good. (United States consular dispatch from Nogales, September 13, 1957.)

Morocco

AGAR-AGAR PRODUCTION AND EXPORTS: The only manufacturer of agar-agar in Morocco produces about 150 metric tons of flakes and powder. For the first five months of 1957, the United States was the leading importer of agar-agar from this manufacturer with about 53,900 pounds out of total exports of 131,000 pounds. The value of the exports to the United States was about US$72,000 and the value of all exports by this manufacturer was about US$170,000. In addition to the exports of refined (flakes and powder) agar-agar, about 282,400 pounds (value US$14,710) of semi-processed algae were exported by this firm during January-May 1957--the United States received 48,395 pounds out of this total

Exports of agar-agar by this manufacturer to other countries for the first five months of 1957 follow: Great Britain, 17,600 pounds; Argentina, 14,740 pounds; Netherlands, 9,240 pounds; Italy, 8,450 pounds; France, 5,940 pounds; Denmark, 1,100 pounds; Switzerland, 660 pounds; Belgium, 240 pounds; and Austria, 50 pounds.

Exports of semi-processed algae to countries other than the United States by this manufacturer during January-May 1957 were: Italy, 40,610 pounds; Spain, 39,158 pounds; and West Germany, 200 pounds.

Stocks of finished agar-agar as reported by this manufacturer as of August 5, 1957, totaled 34.68 metric tons.

The amount of algae or gelidium to be found on Moroccan beaches is subject to variation due to changing winds and tides, but it is estimated that an annual supply of 5,000-10,000 tons is a conservative estimate.

Moroccan Stocks[1/] of Finished Agar-Agar as of August 5, 1957

Type	Packed for Export	In Bulk	Total
	(Metric Tons)		
Flake	3.80	4.28	8.08
Powder:			
Very fine	4.50	15.70	20.20
Medium fine	-	1.70	1.70
Fine	1.00	3.70	4.70
Total	9.30	25.38	34.68

1/ INCLUDES ONLY THE STOCKS REPORTED BY THE MANUFACTURER LOCATED IN MOROCCO.

In addition to the one manufacturer in Morocco, there is also a firm of textile merchants which has an arrangement with a large manufacturer of agar-agar in Madrid whereby they supply the Madrid firm with Moroccan gelidium and receive as payment in kind a portion of the finished agar-agar produced from the raw material. The Moroccan firm of textile merchants disposes of the agar-agar locally or re-exports it. In May this Moroccan firm is reported to have sent 750 metric tons of gelidium to the Madrid manufacturer and received 70 tons of agar-agar in payment.

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SARDINE FISHERMEN DUMP UNSALEABLE CATCHES: Hundreds of tons of sardines were thrown back into the sea in Morocco when fishermen could not find buyers. The by-products factories which buy the fish not taken by the canners offered too low a price, and the fishermen preferred to throw the fish back. The factories were overloaded with fish and were not very interested in buying more fish, points out World Fishing of July 1957.

Netherlands

FISHERY EXPORTS IN 1956: Although production of cured herring was less in 1956 (773,957 barrels as compared with 951,069 barrels in 1955), Dutch total fish exports reached 148,000 metric tons as compared with 146,800 tons the previous year. Total exports of fresh herring amounted to 17,250 tons (12,398 tons in 1955). This was in keeping with increased landings of fresh herring which rose by 2,000 tons to a total of 41,000 tons in 1956. An increasing proportion of herring is exported in filleted form.

Exports of fresh sea fish in 1956 rose to 14,500 tons as compared with 12,812 tons in 1955, reflecting a rise in landings (46,579 tons in 1956, 43,742 tons in 1955).

Exports of shrimp rose sharply from 2,844 tons in 1955 to 3,100 tons in 1956. Main buyers for peeled shrimp were Belgium, France and England. Principal markets for unpeeled shrimp were France and Belgium. The total catch of shrimp (5,930 tons in 1956), however, was 440 tons less in 1956 than in 1955. A total of 20 million oysters were exported in 1956 (against 19.7 million in 1955). Exports to West Germany were increased when that country's previous 30 percent ad valorem import duty was abolished. (Fisheries Newsletter, August 1957, of the Australian Commonwealth Director of Fisheries.)

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REVIEW OF THE FISHERIES, 1956: The total quantity of fish marketed in the Netherlands in 1956 was 582.4 million pounds with a landed value of 102.4 million guilders (US$26.8 million). Of this 532,000 pounds was fish caught by foreign vessels. Sea fisheries accounted for about 62 percent of the total, and coastal fisheries for 32.5 percent.

The herring drift-net fisheries delivered 162.8 million pounds, or 45 percent of the total quantity of fish caught by sea-going vessels.

Ijmuiden landings of all types of fish totaled 197.3 million pounds, and Scheveningen, 127.6 million pounds with a landed value of 23.4 million guilders (US$6.1 million).

Small trawlers operating in the North Sea marketed 6.6 million pounds more fish than in 1955.

The annual report of the Netherlands Association of Herring Traders remarked that the quantity of fish marketed during the 1956/57 season was the second lowest of the postwar period.

NOTE: VALUES CONVERTED AT THE RATE OF 1 GUILDER EQUALS US$0.2612.

Norway

COD FISHERIES TRENDS TO JUNE 22, 1957: Spawning cod and young cod landings in Norway this year for all areas through June 22 amounted to 110,424 metric tons as against 163,046 tons last year and 128,190 tons in 1955 during the same period, points out the June 27 issue of Fiskets Gang, a Norwegian fishery periodical. Of the amount landed, 60,917 tons were sold for drying, 37,292 tons for curing, and 12,235 tons as fresh fish. In addition, 4,493 tons of cod-liver oil were produced, 2,547 tons of cod roe were salted, and 1,075 tons of cod roe were sold for canning or the fresh trade.

The Finmark young cod fishing ended as of June 22 and cod landings amounted to 52,437 tons as compared with 53,562 tons last year and 46,767 tons in 1955.

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FISHERIES ECONOMY STUDY TO BE INITIATED: The Norwegian Government early in September named a 4-member committee to study possibilities for establishing a profitable fishing industry on a permanent basis and to suggest measures that might be indicated to achieve such a goal. Appointment of the study group came in the wake of extended conferences between the Government and representatives of the major organizations of fishermen.

The committee will investigate whether the fisheries now being exploited are the most profitable for the national economy, and whether the present compostion of the fishing fleet is suitable for that purpose. In this connection, the committee is to give its views on corrective measures that might be carried out, as well as evaluate whether investments in the fishing industry should be increased.

The committee has been requested to evaluate whether sales, processing, and export of cod and cod products are handled in a rational and efficient manner, and whether prevailing controls are suitable. In its instructions to the committee, the Government notes that export arrangements should assure efficient and active sales promotion, and that the objective of any price system should be to develop an advantageous policy for the export of fish and fish products. The committee has also been charged with evaluating prevailing arrangements for State guarantees and subsidies to fishermen. Moreover, it will be expected to take a stand on the necessity of temporary State support to Norway's fishing industry. The over-all goal, however, is to work out a permanent solution for establishing the industry on a profitable basis.

A fisheries conference in Oslo August 28-September 2 was called at the urgent request of the fishermen's cooperative sales organization, the trade association, and representatives of the provincial fishermen's associations. At a meeting last summer, these groups also made a strong bid to have the Government guarantee prices and sales of their catch.

At the end of the talks in Oslo this year, the Government pledged prompt action to explore ways and means of establishing the fishing industry on a permanently profitable basis. Moreover, if extraordinary measures are needed to relieve the most pressing difficulties within the industry, the Government promised to propose such measures when the new Parliament convenes in January 1958. Meanwhile, the extraordinary 5 øre per kilo (6.4 U. S. cents a hundredweight) Government subsidy paid to fishermen, scheduled to expire October 1, was to be extended to December 31, 1957. And starting January 1958, the price of fuel-oil types used by fishermen will be reduced.

According to a joint communique, the Government agrees that Norway's cod fisheries are not yielding adequate profits at present export prices. At the same time, it is not convinced that the remedies urged by the fishermen's organizations offer either the best or the only solution to the problem, reports a September 12 news release from the Norwegian Information Service.

Peru

FISH CANNING TRENDS, JULY 1956-JUNE 1957: Peruvian fish canners report that the past fishing year (July 1956-June 1957) was satisfactory. It began exceptionally well but was cut short by a shift in ocean currents. Canners disposed of their packs at satisfactory, though declining, prices, states an August 15 dispatch from the United States Embassy in Lima. They are concerned over the likelihood of severe competition from Japanese canned tuna in European markets during the coming season and, to a lesser degree, over the possible return of salmon to European markets, and over the increasing competition of South African fisheries, particularly under the European common market plan.

Portugal

CANNED FISH EXPORTS, JANUARY-MAY 1957: For the first five months of 1957, canned fish exports amounted to 17,143 tons (1,371,400 cases), valued at US$10.9 million. Sardines in olive oil exported during the first five months of 1957 amounted to 11,193 tons (895,500 cases), valued at US$7.1 million (Conservas de Peixe, July 1957).

During January-May 1957 the leading buyers of canned sardines in olive oil were: Germany, 1,927 tons (valued at US$1,222,000), Great Britain 1,492 tons (US$906,000), France, 1,441 tons (US$900,000), Italy 913 tons (US$555,000), British West Africa 896 tons (US$555,000), and Belgium-Luxembourg 770 tons (US$472,000). These countries purchased 66 percent of the quantity and 65 percent of the value of all Portuguese exports of canned sardines in olive oil.

Exports of sardines in olive oil for the first five months of 1957 to the United States amounted to 524 tons (valued at US$420,000), while exports to the Philippines totaled 235 tons (US$148,000).

Table 1-Portuguese Canned Fish Exports, January-May 1957

Product	January-May 1957	
	Metric Tons	US$ 1,000
Sardines in olive oil	11,193	7,076
Sardinelike fish in olive oil	2,568	2,105
Sardines & sardinelike fish in brine	1,015	253
Tuna & tunalike in olive oil	533	462
Tuna & tunalike in brine	103	70
Mackerel in olive oil	1,227	733
Other fish	504	238
Total	17,143	10,937

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Portuguese Canned Fish Exports, January-July 1957

Product	January-July 1957	
	Metric Tons	US$ 1,000
Sardines in olive oil	15,600	9,633
Sardinelike fish in olive oil	3,045	2,444
Sardines & sardinelike fish in brine	1,114	277
Tuna & tunalike in olive oil	1,134	946
Tuna & tunalike in brine	245	144
Mackerel in olive oil	2,167	1,233
Other fish	666	295
Total	23,971	14,963

CANNED FISH EXPORTS, JANUARY-JULY 1957: For the first seven months of 1957, canned fish exports amounted to 23,971 tons, valued at US$15.0 million. Sardines in olive oil exported during the first seven months of 1957 amounted to 15,600 tons, valued at US$9.6 million (Conservas de Peixe, September 1957).

During January-July 1957 the leading buyers of canned fish were: Italy, 3,592 tons (valued at US$2,214,000); Germany, 3,461 tons (US$2,122,000); France, 2,237 tons (US$1,404,000); Great Britain, 2,234 tons (US$1,376,000); and the United States, 2,136 tons (US$1,872,452). These countries purchased 57.0 percent of the quantity and 60.0 percent of the value of all Portuguese exports of canned fish. Exports of sardines in olive oil for the first seven months of 1957 to the United States amounted to 785 tons (valued at US$661,000), and 1,046 tons of anchovies (valued at US$1,043,826).

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FISHERIES TRENDS, JULY 1957: Sardine Fishing: During July 1957, the Portuguese fishing fleet landed 7,556 metric tons of sardines (valued at US$1,184,382 ex-vessel, or $157 a ton). In July 1956, a total of 5,651 tons of sardines were landed with an ex-vessel value of US$906,000.

Sardines purchased by the canneries during July amounted to 4,504 (59.6 percent) tons (valued at US$753,913 ex-vessel or $167 a ton). Only 49 tons were salted, and the balance of 3,003 tons, or 40 percent of the total, was purchased for the fresh fish market.

Other Fishing: The July 1957 landings of fish other than sardines consisted of 2,768 tons (value US$464,139) of anchovy and 4,953 tons (value US$238,991) of chinchard. (Conservas de Peixe, September 1957.)

Thailand

REVIEW OF THE FISHERIES, 1947-57: Substantial progress has been made by the Thai fisheries industry during the past decade. Mechanized boats increased from 121 in 1947 to 1,082 in 1956; the quantity of gear in use in the Gulf of Thailand increased from 4,148 in 1947 to 11,439 in 1956; the annual catch increased from 154,000 metric tons in 1947 to almost 213,000 tons in 1956; exports of salted fish soared from 2,882 tons to almost 20,000 tons in the same period; while the value of

the annual catch has risen from 556 million baht (US$26.7 million) in 1950 to 976 million baht (US$46.8 million) in 1955. The Government's program of stocking inland waters has likewise progressed remarkably--the number of fish being distributed to ponds and lakes increased from 112,000 in 1947 to about 6 million in 1956.

Although the Gulf of Thailand has yet to be thoroughly surveyed for its potential commercial value, experts believe that on the basis of present catch from peripheral areas the entire Gulf holds great promise. The Japanese are already at work in the Indian Ocean off the West Coast of Thailand and have sent in vessels, equipment, and experts to develop the continental shelf which is about 60 miles off the coast.

The Department of Fisheries has plans for the continued development and improvement of the entire fisheries program. This includes marine fishing, training, and equipment aid to fishermen, building of cold-storage plants, processing plants, wharfs, jetties, etc., and an educational indoctrination program to increase fish consumption. It is hoped that per capita consumption, which is now about 20 pounds per annum, can be raised to about 35 pounds per annum. The chief obstacle in the way of these plans is financial; the Budget has not yet provided for some 60 million baht (US$2.9 million) needed for initial development or even a yearly subsidy of 10 million baht (US$480,000) asked for by the Fisheries Department. It is unlikely, therefore, that the Fisheries Department plans will be wholly realized.

The cold-storage plant at Bangkok has not been as successful as anticipated. A combination of high storage fees and the difficulty of changing fish marketing customs seems to be responsible for the disappointing result. (United States Embassy dispatch dated August 21, 1957, from Bangkok.)

NOTE: VALUES CONVERTED AT THE RATE OF 1 BAHT EQUALS US$0.048.

Turkey

FRESH AND FROZEN BONITO EXPORTS: Turkey exports considerable amounts of fresh, chilled, and frozen pelamid and bonito (Latin name for both varieties is Sarda sarda). Year after year there appears to be wider demand for bonito.

Turkey's Exports of Fresh and Frozen Bonito, 1955, 1956, and First Quarter 1957, by Country of Destination

Destination	First Quarter 1957			1956			1955		
	Quantity	Value		Quantity	Value		Quantity	Value	
	1,000 Lbs.	TL 1,000	US$ 1,000	1,000 Lbs.	TL 1,000	US$ 1,000	1,000 Lbs.	TL 1,000	US$ 1,000
East Germany	15.4	3.7	1.3	-	-	-	-	-	-
Federal Germany	-	-	-	13.2	2.7	1.0	.5	.2	.1
Austria	52.8	9.5	3.4	184.1	37.0	13.2	11.0	2.1	.8
Czechoslovakia	202.4	48.1	17.2	445.1	117.6	42.0	176.0	40.3	14.4
France	330.0	79.6	28.4	149.6	25.5	9.1	-	-	-
Bulgaria	716.1	131.0	46.8	3,087.9	828.9	296.0	1,014.9	228.4	81.6
Italy	4,464.2	787.7	281.3	14,523.0	2,770.4	989.4	7,406.3	1,783.7	637.0
Hungary	-	-	-	-	-	-	121.0	33.1	11.8
Poland	-	-	-	15.4	4.5	1.6	-	-	-
Rumania	1,138.3	260.3	92.9	2,990.5	689.9	246.4	2,843.8	592.9	211.7
Yugoslavia	2,002.0	484.6	173.1	4,711.2	1,197.8	427.8	3,379.1	910.7	325.2
Greece	3,951.7	1,238.0	442.2	17,037.3	5,675.2	2,026.9	8,450.6	2,694.5	962.3
Israel	-	-	-	220.0	70.0	25.0	68.2	22.1	7.9
Syria	-	-	-	4.3	.9	.3	-	-	-
Lebanon	-	-	-	6.1	1.2	.4	2.1	.6	.2
Morocco, Algiers, Tunisia	-	-	-	149.6	40.8	14.6	-	-	-
Total	12,872.9	3,042.5	1,086.6	43,537.3	1,462.4	4,093.7	23,473.5	6,308.6	2,253.0

NOTE: VALUES CONVERTED AT RATE OF 2.80 TURKISH LIRAS EQUAL US$1.

During 1955 the exports of pelamid and bonito amounted to 23.5 million pounds while during 1956 they rose to 43.5 million pounds.

Turkey exports also in considerable quantities salted, dried, and smoked pelamid and bonito. In addition there are also possibilities for export of canned bonito. (An October 1 letter from Et ve Balik Kurumu Umum Mudurlugu.)

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CLARIFICATION OF FISH NAMES IN ARTICLE ON "FISHERIES OF BLACK AND MARMARA SEAS:" Additional information has clarified the names of some of the fish mentioned in the article "Fisheries of Black and Marmara Seas" which appeared in the June 1957 issue of Commercial Fisheries Review (pp. 56-62).

Fish Mentioned in Article	Common Name	Turkish Name	Scientific Name
Bonito	Bonito	Pelamut baligi	Sarda sarda
Bluefin tuna	Bluefin tuna	Orkinos	Thunnus thynnus
Spanish mackerel	Jacks	Istavrid	Caranx trachurus
"Lufer"	Bluefish	Lufer	Pomatomus saltatri
Anchovies	Anchovies	-	-
Blue mackerel	Mackerel	Iskumru	Scomber scomber
"Torik"	Skipjack or striped tuna	Torik	Katsuwonus pelamis
"Palamut"	Bonito	Pelamut baligi	Sarda sarda
Green mackerel	Thimble-eyed mackerel	Kolyos or kolyoz	Scomber colias
Sardines	Pilchard	Sardelya	Clupea pilchardus
Sturgeon	Sturgeon	Mersin baligi	Acipenser sturio
Red mullet	Red surmullet	Barbunia or barbanya	Mullus surmuletus

U. S. S. R.

ANOTHER LARGE TRAWLER LAUNCHED IN GREAT BRITAIN: The 16th of 20 Arctic trawlers being constructed by a British shipyard for Russia was launched on July 31, 1957. This trawler was launched 30 days after the 15th had been launched, points out the August 9 issue of The Fishing News, a British fishery periodical.

These trawlers, almost 190 feet in over-all length, have a loaded displacement of about 1,300 tons, and are specially constructed for Russia to meet Arctic conditions.

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EXPANSION OF NORTH SEA FISHING OPERATIONS PLANNED: Russian plans to concentrate more attention on North Sea fishing have been prepared by the Baltic Research Institute of Oceanography.

A North Sea study group was formed last year and charged with preparing recommendations for the development of commercial herring fisheries in the North Sea. Attention is also being paid to the possibility of off season herring fishing.

Soviet biologists are planning research at different seasons in the northern and central areas of the North Sea, including the Norwegian shelf, the Orkneys, and the Hebrides--and closer cooperation with Norway is envisaged.

Up to now, Russia's main source of herring catches has been the North Atlantic, but for many reasons--the concentration of vessels among them--the North Atlantic has been producing uneven results.

Over a year, Atlantic catches are higher, but there are certain times, such as last April, when the North Sea is more rewarding. Soviet summer catches near the British coasts have been practically equal to those of the North Atlantic, yet North Sea fishing methods have yet to be improved.

Maps showing the 1957 concentrations of herring are being prepared. Migrations covering the North Sea and the English Channel are being studied. Different depths of shoals during the whole year will be recorded, together with the sources of food. And water and weather influences on distribution and behavior of herring will be noted.

Much of this work--meteorological and biological--has been done in the current season in the main North Sea fishing areas.

Early spring concentrations of herring were confirmed along the Norwegian shelf, where the fish arrive from the Northwest. This offers good prospects of catches at the end of winter and the beginning of spring.

During June and July, exploratory trips established that, north of the 59th parallel, herring concentrations justifying commercial operations were found only at the sea bottom.

A special Soviet delegation representing Baltic, Latvian, and Polar branches, recently visited Gdynia to exchange information on research in Baltic, North Sea, and Atlantic fisheries with the Polish Fisheries Institute.

Exchange visits of experts and research vessels have been suggested between Russia and Norway. As their fishermen operate for the same categories of fish in the same areas, it is felt that reciprocal research would be of advantage to both nations in increasing catches of herring and cod.

Soviet expansion in Far East fishing is also outlined in a recent report given by the North Korean Deputy Premier during a meeting of the Korean Communist Party's central committee.

It is expected that this year's herring catches will be double those of last year.

International cooperation is centered in the Commission for Research in Fisheries in the Western Pacific. The commission ended its second session in Moscow on August 22. It includes representatives of Russia, China, North Korea, and Vietnam. Member states have pooled experience in breeding various kinds of commercial fish. A plan has been prepared for marine research in the areas of the Japanese, the Yellow and the East Chinese Seas. (The Fishing News, September 6, 1957.)

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ULTRAVIOLET LIGHT FOR UNDERWATER PHOTOGRAPHY: Russian scientists have developed an ultraviolet searchlight for use with underwater television and film cameras to observe and photograph fish in their natural surroundings.

Previously powerful lights were used which, while they attracted some fish, frightened away others from the deeper parts of the ocean where no light penetrates. The Russians are using a bathysphere for photographing underwater life. (Fisheries Newsletter, August 1957.)

United Kingdom

FISHERY SUBSIDIES CONTINUED: The British Government announced that they propose to keep the rates of the white fish subsidy unchanged, but to increase the rates of the herring subsidy. This is the effect of two schemes which the Secretary of State for Scotland and the Minister of Agriculture, Fisheries and Food laid before Parliament recently. The schemes have to be approved by both Houses of Parliament.

The white fish subsidy scheme provides for a continuation of the white fish subsidy at the current rates for the 12 months to July 31, 1958. These rates have been in operation since August 1, 1956. For vessels between 70 and 140 feet in length, and for seine-net vessels which normally make voyages of more than 7 days, the subsidy takes the form of a fixed payment, varying according to the size and type of vessel, for each day at sea. For vessels of 70 feet and under, it takes the form of a flat-rate subsidy of 8d. (8.8 U. S. cents) per stone (14 pounds) of fish landed (6d. or 6.6 U. S. cents for ungutted fish). The new scheme removes the limit of 300 days at sea previously set for which a vessel could claim subsidy in any one year.

The herring subsidy scheme provides for payment of the herring subsidy for the 12 months to August 31, 1958, at increased rates. The landings subsidy paid to vessels under 40 feet in length is increased from 3d. to 3½d. (3.3-3.85 U. S. cents) per stone (14 pounds) of fish, and the rates per day at sea paid to larger vessels will vary from £6 10s. (US$18.20) for motor vessels of 40-80 feet, to £10 (US$28) for steam vessels not exceeding 140 feet.

Under the White Fish and Herring Industries Acts of 1953 and 1957, the white fish and herring subsidies may be paid up to 1961, with the possibility of extension to 1963. The subsidies are intended to tide the industry over the difficult period of adjustment while the near- and middle-water and inshore white fish industry is placed on an economic footing with the aid of grant and loans for the modernization of the fleet and the replacement of obsolescent coal-burning vessels. The herring subsidy was introduced last May to provide herring vessels with broadly comparable assistance to that already given to white fish vessels.

In fixing the rates of subsidy for the coming year, Ministers have had regard both to the economic position of the industry and to the fundamental objective of establishing an economic fleet capable of standing on its own when the present arrangements for exchequer assistance are due to end. (World Fishing, August 1957.)

NOTE: ALSO SEE COMMERCIAL FISHERIES REVIEW, OCTOBER 1956 P. 64, APRIL 1956 P. 41.

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FISHERY TECHNOLOGICAL RESEARCH, 1956: Freezing Fish at Sea: The British Food Investigation Board, in their report for 1956 (Food Investigations, 1956), comment on the experiments in the freezing and preservation of fish at sea to the effect that from the "tests carried out on a commercial distant-water trawler it has been shown that by using freezing equipment aboard the trawler the market quality of the fish treated in this way can be greatly improved."

It appears, the report adds, that it would be possible to build a trawler of the same size as those now existing that would be more economical in operation. This could be achieved by the incorporation of a freezing plant and a return to propulsive power considered adequate a year or two ago. The freezing plant could become an essential part of the distant-water trawler's equipment. Gradual development of the orthodox Arctic trawler is now a possible alternative to large factory vessels.

Preserving with Antibiotics: "Another promising method of improving the preservation of fish during the journey back to port," the report states, "is the use of very small quantities of antibiotics in the ice in which the fish is stored. Trials which have been carried out on the research trawler Sir William Hardy have demonstrated that certain antibiotics incorporated in the ship's ice supply can result in the quality of the fish landed being greatly improved. The regulations governing the treatment of foodstuffs in the United Kingdom, however, do not at present allow the use of such substances in the preserving ice.

Assessing Freshness: "Methods of assessing the freshness of fish are also being investigated and it is hoped that a simple test can be developed in which the quality of the fish can be determined by the color changes in a strip of impregnated paper laid directly on the fish under examination."

The report states that at present the procedure for measuring the color produced is to wash out the colored substance from the test paper after the latter has been in contact with the fish surfaces for a specific time and then to estimate the color intensity colorometrically. It has been found that differences in the color produced occur at different places on the skin and on the gills of fish during spoilage. The test appears to work as well with flat fish, such as lemon sole and plaice, as with cod and haddock, and has also been applied to smoked white fish with promising results. With fillets the color reactions are different in intensity in a given time from those with the surface of whole fish. Specific standards for fillets will therefore need to be determined.

For testing a large number of samples, for instance, at the fish market, the procedure would obviously be too complicated, and attempts have been made to overcome these difficulties by directly noting the color intensity on the paper. One method has been to use papers containing the tetrazolium salt in a graded series of concentrations along the length of each paper strip. In this case, degree of freshness is shown by the number of concentration bands affected in a given short time. The other method employs a series of uni-

formly impregnated papers with much lower concentration of salt than those used hitherto. Both procedures have given promising results, particularly with spoiling fish at or near the condemnation level. Further work is proceeding.

Handling Fish on Trawlers: Ways of improving the techniques of stowing fish on trawlers are constantly sought. Boxing at sea and stowage in chilled sea water, or a combination of the two, are under consideration. Work on stowage in chilled sea water is at a very early stage.

Investigations of the effect of boxing on the quality of distant-water fish have begun. At the same time a theoretical study has been carried out into the limitations of various designs of boxes and supports in relation to organization in the trawler's hold and to availability of space. If boxing could replace shelfing, more space would be released for a plant to freeze the early part of the catch. On the other hand, if boxing replaces bulking it seems likely that more space will be used.

Fillet Spoilage: A large proportion of the catch is distributed from the ports as fillets. From experiments completed this year it appears that the spoilage behavior of fillets, particularly those taken from whole gutted fish stored in ice for more than a few days, is different from that of the whole fish themselves. For example, although fillets taken from one-day iced haddock and then stored in ice spoiled at about the same rate as the whole fish, fillets taken from 11- and 16-day iced fish spoiled more slowly than the whole fish.

The effect on the spoilage of fillets of such factors as washing in tap water, dipping in solutions of antibiotics (chlortetracycline) or antibacterial agents (1:6 di-4-chlorophenyl-diguanido-hexane and di-n-decyl-dimethylammonium bromide) and wrapping in polythene bags has been studied. The fillets were stored at temperatures ranging from 0° to 15° C. (32° to 59° F.). It was found that washing (for five minutes) extended the storage life significantly over that of the unwashed controls. Of the "dip" solutions, only that containing chlortetracycline (20 p.p.m. for five minutes) was effective in prolonging storage life--by as much as two to three days at 10° to 12° C. (50° to 53.6° F.).

Wrapping did not appear to result in quicker spoilage as judged by chemical and bacteriological tests or by the odor and flavor of the cooked fish. In the raw state, however, the wrapped fish appeared to have stronger odors, but these quickly disappeared after opening the package.

Prepackaging: A recent field survey conducted jointly with the Printing, Packaging and Allied Trades Research Association and a technical officer of the White Fish Authority attached to the Humber Laboratory, has indicated that apart from kippers and kipper fillets, the commercial development of consumer packs of unfrozen fish has so far been very slight.

Earlier work at the Torry Research Laboratory had suggested that the keeping quality of prepackaged fillets at 0° C. (32° F.) was little different from that of unwrapped fillets, and this has been confirmed, states the report, adding that there seem to be no fundamental technical difficulties associated with the prepackaging of fish and no reason why it cannot be combined with the sale of other commodities.

Temperature Conditions at Fish Markets: Temperature conditions on the fish market and at fish merchants' premises have been studied. About 7,000 fish temperatures have been taken on Hull and Grimsby fish markets and at fish merchants' premises on the market and outside. The initial quayside temperature of distant-water fish is generally close to 0° C. (32° F.). No significant difference was found between bulk fish and shelf fish. No temperatures were registered below -1.1° C. (30° F.), at which fish

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Fish can stand on the market for up to 6 to 8 hours after unloading before it is sold, and a survey of the rate at which fish was disposed of at Hull indicated that up to 15 percent can still be unfilleted and uniced even 8 hours after sales commence.

The fish on the outside of a market container rises in temperature faster, so that at any one time there is a considerable variation in the temperatures registered within a stack or even a single container. With an atmospheric temperature of about 18.3° C. (65° F.) the temperature of a fish can be expected to be within the range 0° to 11.1° C. (32° to 52° F.) six hours after unloading and between 2.2° and 15.6° C. (36° and 60° F.) after 12 hours. At Grimsby, where rectangular containers are stacked four or five high, there was a maximum average difference of 3° to 4° F. in the temperatures of fish in different layers. The average temperature of fish before filleting was 5.9° C. (42.7° F.). at Hull where deep tub-shaped containers (kits) are used, and 4.2° C. (39.5° F.) at Grimsby for bulk fish, although for shelf fish, which is not usually stacked so high, it was 6.3° C. (43.4° F.).

After filleting and washing in water, the temperature of which was around 9.5° C. (50° F.) in the summer, fish at both Hull and Grimsby immediately prior to packing in boxes with ice had an average temperature of between 8.9° and 9.4° C. (48° and 49° F.), the average temperature rise during the process varying from 2.5° to 4.8° C. (4.5° to 8.5° F.). After icing in a two-stone (28-pound) box in the normal commercial manner, fish at the center cools very slowly and even after 10 hours may still not have cooled to below 1.7° C. (35° F.). (Fish Trades Gazette, August 17, 1957.)

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"FLYING SAUCER" FLOAT: An improved trawl plane float known as the "Flying Saucer" (fig. 1) has been developed by a Grimsby, England, gear firm. It is claimed that the new float gives absolute stability at fast towing speeds and maximum upthrust combined with minimum drag, resulting in a performance which at 3 knots equalled the upthrust obtained from its forerunner, namely, 38 pounds, with lowered drag reduction of only 11 pounds. Furthermore, when towed at 6 knots, the upthrust increased to 45 pounds and the drag reduction came down to 10 pounds with absolute stability. The new float's attachment lug is extended in such a manner as to form a stabilizer. The improved trawl

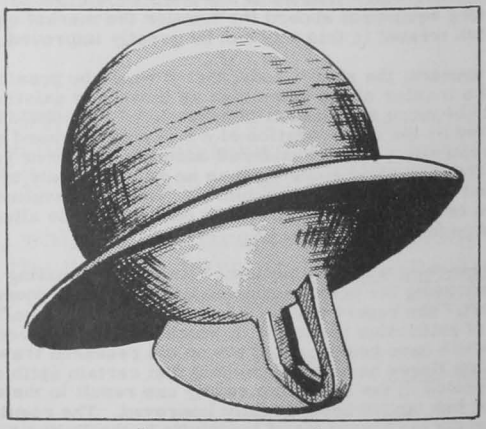

FIG. 1 - "FLYING SAUCER" FLOAT. NOTE THE EXTENSION OF THE ATTACHMENT LUG WHICH FORMS A STABILIZER.

plane, developed after some research by this Grimsby firm, will shortly be available.

Such factors as handling, freedom from fouling, water pressure, and manufacturing simplicity have all been taken into consideration in developing this new float with a high lift-drag ratio. The firm claims that the performance of the new float is unaffected by such things as direction of tow or tide. It is of a size which enables it to give a fully-distributed lift to the headline thus enabling the headline to retain its normal arc, and insuring unrestricted flow so essential to the meshes of the net.

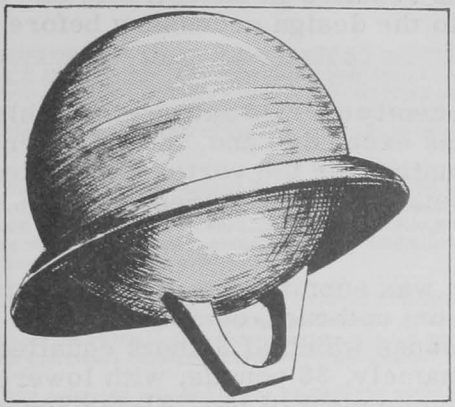

FIG. 2 - ORIGINAL TRAWL PLANE FLOAT.

FIG. 3 - HYDRODYNAMIC TESTS OF ORIGINAL TRAWL PLANE FLOAT REVEALED THAT THE DRAG FACTOR WAS EXCESSIVE AND OVERCAME UPTHRUST AT SPEEDS OF TOW ABOVE 3 KNOTS. SKETCH SHOWS VORTEX CREATED BY DRAG IN THE ORIGINAL MODEL OF THE WEIGHTED PLANE BEING TOWED IN A SWIMMING POOL.

Further experiments in design embodying the best features of the various floats tested are being continued and developed by the Grimsby firm, and it is hoped that the "Flying Saucer" is merely a forerunner of more efficient floats to follow. (The Fishing News, August 30, 1957.)

The purpose of the trawl float is to support the headline of the trawl in these three situations: (1) when shooting: to assist the gear in paying away without fouling; (2) when towing: to keep open the mouth of the trawl in its proper arc insuring unrestricted flow of the net; (3) when hauling: to assist in getting the gear inboard.

Additional lift is always considered desirable, but only if obtained without excessive drag and such lift can be dispersed throughout the entire length of the headline to insure that the proper arc of the mouth of the trawl is maintained to prevent the flow of the net from being restricted.

Distortion of the headline restricts the opening of the mouth of the trawl and reduces its catching power accordingly, because the actual volume of ocean covered by the mouth of the trawl is correspondingly less.

The best results can therefore be expected from a number of regularly-spaced floats fitted with a hydrodynamically-designed planing surface, to give additional upthrust while being towed, and yet retaining sufficient static buoyancy to be of use when shooting and hauling operations are in progress.

Practical tests and research on a dozen or more different types of planing floats designed and supplied by the Grimsby firm were recently carried out in hydrodynamic tanks. The rig to which the float is attached in the test tanks during the test is suspended beneath an observation cabin.

The cabin has instruments for measuring buoyancy, upthrust, and drag, and accommodates 3 or 4 operators for recording the findings of each test and observing the actual behavior of the submerged float during each run at whatever speed of tow.

The behavior of submerged gear has previously been observed by frogmen but only at very slow speeds, which proved in the light of the above tests to be somewhat misleading, particularly in the case of the original trawl plane float (fig. 2).

Tests with the original trawl plane float (surrounded by the circular foil to provide a planing surface to give extra lift) showed that when towed at 3 knots, an additional upthrust of 38 pounds was obtained but this was accompanied by a drag reduction of 30 pounds. When the speed of tow was increased beyond $3\frac{1}{2}$ knots, the drag increased causing the trawl plane to stall. This resulted in undesirable oscillatory behavior, making geometrical correction to the design necessary before further tests could be made.

Only when thorough hydrodynamic tests were recently carried out was it established that the drag factor of the original trawl plane was excessive and, in fact, overcame upthrust at speeds of tow above $3\frac{1}{2}$ knots accounting for the vortex illustrated in figure 3. This was previously mistaken for lift but, in fact, is evidence of excessive drag.

A variety of modifications were made, and each was submitted to further tests until absolute stability at fast towing speeds, maximum upthrust, combined with minimum drag, was obtained, resulting in a performance which at 3 knots equalled the upthrust obtained from the original trawl plane namely, 38 pounds, with lowered drag reduction of only 11 pounds. This led to the development of the "Flying Saucer" float.

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400 NEW FISHING VESSELS IN FOUR YEARS: The British White Fish Authority (WFA) recently reported the progress made in rejuvenating Britain's fleet of near- and middle-water vessels and inshore fishing craft (excludes vessels classified as "distant-water craft") through the operation of the Grants and Loans Scheme introduced in 1953.

At the inception of the scheme, the Government aim was to build some 500 large craft in 10 years through the allocation of some £20 million (US$56 million) to be administered by the WFA.

Towards that objective 81 near- and middle-water trawlers have been completed, and 40 more are in the process of being built. Construction of 149 has been approved. Of inshore craft, 309 have been completed with 43 under construction. The grant is confined to vessels below 139 feet.

Building of distant-water trawlers is not included. (The Fishing News, August 30, 1957.

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NEW FILM ON TRAWL FISHERY: "Trawler Boy" is a new half-hour British fishery film. It is a color documentary made for two British private firms and the British White Fish Authority. It was chosen for showing at the Edinburgh Film Festival.

The film, already shown on independent television and in a number of theaters at fishing ports, tells of a two weeks' voyage by the Fleetwood Diesel trawler Boston Neptune as seen through the eyes of a 16-year-old learner deckhand.

"Trawler Boy" was made in Eastman color and in 16 mm. and 35 mm. It is being distributed by the two British firms and the White Fish Authority. (The Fishing News, August 23.)

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SCOTTISH PLANT DEHYDRATES FISH FILLETS: A Scottish plant processes raw fish fillets by evaporating their water content under vacuum at a low temperature. The processing unit is capable of drying 675 pounds of white fish to a moisture content of 5 percent in about 6 hours. Reconstitution is done simply by immersing the fillets in fresh cold water, when they take on the consistency of firm fresh fillets ready to be cooked in the same way as sea-fresh fish. (August 1957 Fisheries Newsletter of the Australian Commonwealth Director of Fisheries.)

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SUPPORT OF THREE-MILE LIMIT AT GENEVA CONFERENCE INDICATED: Great Britain's policies in regard to territorial waters, fishery limits, and fisheries conservation will be defined more precisely early in 1958 at the World Conference on the Law of the Sea, which is to be held at Geneva.

With the Faroese demand for a revision of the last agreement still being considered by the Foreign Office, there is some speculation as to what line the United Kingdom will now take when its representatives will be making statements of policy at the Geneva conference.

It is believed that Britain will continue to support the old three-mile limit for territorial waters as a general policy without, however, contradicting any particular agreements with individual countries made in recent years.

Any solutions reached by the conference would be embodied in "rules of the sea" for the future. The conference's conclusions may well affect existing arrangements.

Although Britain has in recent years signed agreements which give other countries protected waters beyond the three-mile limit, it is considered that these pacts will not cause any embarrassment at the conference.

At the time the agreements with Russia and Iceland were signed, the British reserved her legal rights on the three-mile limit.

Britain is likely to hold informal discussions with the Danes on their request for new negotiations on limits around the Faroes.

The Faroese would like four miles of protected waters instead of three. They also want an agreement on landings of Faroese fish in Britain, but that must be negotiated by the two fishing industries.

The Foreign Office is now studying a Danish memorandum on the subject, which has been discussed with the English and Scottish Fisheries Department (Fish Trades Gazette, August 24, 1957).

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TEN PERCENT OF BRITAIN'S FISH CATCH FROZEN: About 10 percent of Britain's fish catch is now frozen. There was virtually no freezing before 1938. In 1955 more than 68,000 metric tons of fish were frozen, resulting in a pack of 32,000 tons of quick-frozen processed fish.

Principal export markets for frozen fish are the United States and Australia, but recently a new trade outlet has been found in Eastern Europe.

Retail selling of frozen fish by grocers and food markets, and sales to hotels and shipping lines, are increasing. (August 1957 Fisheries Newsletter of the Australian Commonwealth Director of Fisheries.)

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SECOND DIESEL-ELECTRIC TRAWLER SAILS FOR ARCTIC: Britain's second commercial Diesel-electric trawler, the 205-foot 800-ton Cape Trafalgar, underwent speed and fishing tests early in September before setting course for the Arctic on her maiden voyage. The shipyard that built the vessel considers her a revolutionary type.

The sleek, high-powered extremely maneuverable Diesel-electric trawler, capable of slicing 24 hours or more off an Arctic voyage, is the British fishing industry's answer to the increasing demand for high-quality fresh fish.

The Cape Trafalgar cost over Ł250,000 (US$700,000) and was built without a government grant or loan. The first supertrawler, the Portia, has been fishing from Hull since October 1956. The keel of a third will be laid later this year.

Like two of the owners' other ships, the Trafalgar has a bulbous bow, which gives increased buoyancy forward and extra speed without needing extra power.

With an over-all length of 205 feet and a moulded breadth of 33 feet 6 inches, she has a flush main deck, a balanced flair to the whaleback forecastle with high bulwarks, and is designed for starboard fishing only.

There is an extension of the after deckhouse on the port side almost to amidships. This offers better scope for internal access, and extends crew accommodation. Many of the crew will occupy air-conditioned steam-heated single and double cabins. For normal wet fish voyages, the entire crew will be housed above main-deck level.

The superstructure is designed to minimize icing in northern latitudes, at the same time providing good observation. The midship structure, although in three tiers, is compact and offers the smallest aspect to the weather.

Although Portia had three Diesel engines (two small and a big one), there are four of the same size in the Cape Trafalgar.

Her electric propulsion motor, capable of developing 1,500 shaft horsepower at a propeller speed of 175 revolutions a minute, is driven by four 330-kw. 330-volt main generators, coupled direct to the Diesel-marine engines.

The trawler can operate with combinations of one to four generators, a feature which almost entirely rules out the possibility of her being completely immobilized at sea--an important safety factor. The winch is operated from any one

of the main generators, and the windlass is also electrically driven.

There is complete control of the ship from the bridge--an intriguing place with a wealth of apparatus. If the skipper wants to know the temperature in the fish hold, for instance, he has no need to leave the bridge. A special device tells him the answer.

Yet amid the welter of equipment one finds a smaller version of a traditional wheel, for the steering is power-assisted.

The fish room has a capacity of 17,200 cubic feet. Diesel oil tanks amidships hold 230 tons--enough fuel to give her a cruising radius of 40 days. The galley, too, is oil-fired. (The Fishing News, September 6, 1957.)