

INTERNATIONAL

Some Major Fishing Industries Are in Trouble

The tide is turning for several of the world's major fishing nations--including Norway, the United Kingdom, Iceland, and Canada, where fishing is both important to the economy and an honored tradition. Their fisheries expanded appreciably during the past few years. Today, these nations are dusting off subsidy programs to buoy their industries.

Here is an outline of the situation:

- **NORWAY**, Europe's leading fishing nation and 5th in the world, was hit hard in 1967: prices fell drastically; the stockfish market was virtually lost, so too was the fresh-fish market in the United Kingdom; the boatbuilding boom ended; she suffered losses from currency devaluation by her major customers. And 1968 began with the awful collapse of the winter herring fishery.

Norway was forced to give US\$850,000 to cover losses from devaluation. She is extending an interest-free US\$4 million loan to cover inventories of stockfish exporters. She has offered to provide 7,000 tons of stockfish to the UN's Food and Agriculture Organization for the World Food Program. She probably will increase exvessel prices by larger subsidies.

- **UNITED KINGDOM** is completely reversing its fishery policy. This had been in line with recommendations of the Organization for Economic Cooperation and Development designed to end operating subsidies. Now the UK is increasing aid to parts of the industry. Government and industry leaders are discussing a minimum price scheme. Market sharing with the European Free Trade Association (EFTA) is being investigated.

- **ICELAND**'s industry suffers from inefficiency and over capacity. Landings have fallen. She has lost a valuable stockfish market. The Government is providing US\$5.1 in new subsidy funds to aid the industry.

- **CANADA** is adopting floor price supports for several Atlantic coast species. The

support would guarantee a minimum price to fishermen in 1968 for cod, ocean perch, or flounder.

- **GREENLAND**'s industry is enveloped by a net of adversity.

- **SWEDEN**'s fishermen have seen their earnings fall 30 percent in 2 years.

- **FRANCE**, hit by fishermen's strikes, has moved to establish minimum import prices for several fish species.

- **WEST GERMANY**'s fishing industry is suffering from financial deterioration. The coastal provinces have asked for Government help.



Increase in 1968 Yellowfin Tuna Quota Adopted

Member countries of the Inter-American Tropical Tuna Commission (IATTC) voted unanimously to increase the 1968 catch quota for yellowfin tuna in the eastern tropical Pacific Ocean by 13,000 short tons. The new quota is 106,000 short tons. The increase was based on catch data and observations of fishermen and scientists indicating a yellowfin tuna abundance higher than previously indicated.

Vote by Mail

The vote to increase the quota was taken by correspondence among IATTC member governments--Canada, Costa Rica, Ecuador, Mexico, Panama, and the U. S. Concurrence was announced May 21 by IATTC's Director of Investigations.

Fishery Is Closed

The fishery was closed on June 18. After that date, U.S. tuna seiners would be allowed an incidental take of yellowfin up to 14 percent. Bait boats could take an incidental catch of 40 percent until they reached 1,500 tons.



30 Asian Vessels Fish for Atlantic Tuna

About 20 Japanese and 30 Formosan and South Korean tuna long-liners were fishing for albacore tuna in the eastern Atlantic Ocean off Angola in early May. Fishing was reported good. The vessels were catching around 3 metric tons and as much as 5 tons per set. However, because the albacore were small (29-31 pounds), the export price dropped sharply to around \$445 a short ton c.i.f. Puerto Rico. Large albacore taken in the Atlantic were bringing around \$475 a short ton c.i.f. Puerto Rico.

Summer Season

As the summer season approaches, albacore fishing begins to pick up in the more northerly regions of the Atlantic, off the Azores and Bermuda Islands, and in the West Indies off Saint Martin Island. Good fishing in those regions could further depress the albacore export price.

In Gulf of Guinea

Yellowfin fishing in the Gulf of Guinea, where good catches had been made, was reported declining in early May. The fishery in the central equatorial Atlantic also was tapering off. ("Suisan Tsushin," May 8, 1968.)



WHAT IS THE SOURCE OF THE GULF STREAM?

The Gulf Stream received its name because of the misconception that its source was the Gulf of Mexico. It is now known that water of the Gulf contributes very little to the flow of the Gulf Stream.

Two currents, the North and the South Equatorial Currents, join to flow through the passages between the Windward Islands into the Caribbean Sea. The resultant current, flowing through the Yucatan Channel, has only one outlet between Florida and Cuba. Off the southern coast of Florida, other currents coming from the northern coast of Puerto Rico and eastward from the Bahamas add to the flow of the Gulf Stream. ("Questions About The Oceans," U. S. Naval Oceanographic Office.)

Sweden Aids India's Fisheries

The Swedish International Development Authority (SIDA) will present 2 trawlers to India as gifts late this summer after shake-down and crew training. The 2--"Blue Fin" and "Red Snapper"--were launched at Solvesborg in southern Sweden on April 25, 1968.

Both trawlers are the Norwegian Norske Veritas class: 93 feet long, crew of 13, accommodations for 16 students, and equipped with a small laboratory.

Vessels Under Aid Agreement

The vessels, training program, and cost of cruise to India are all included in the gift. It will be made under the 1965 Swedish-Indian aid agreement. Total cost: US\$700,000, including cost of building and US\$563,000 cost of equipping. FAO provided technical advice in selecting suitable vessels.

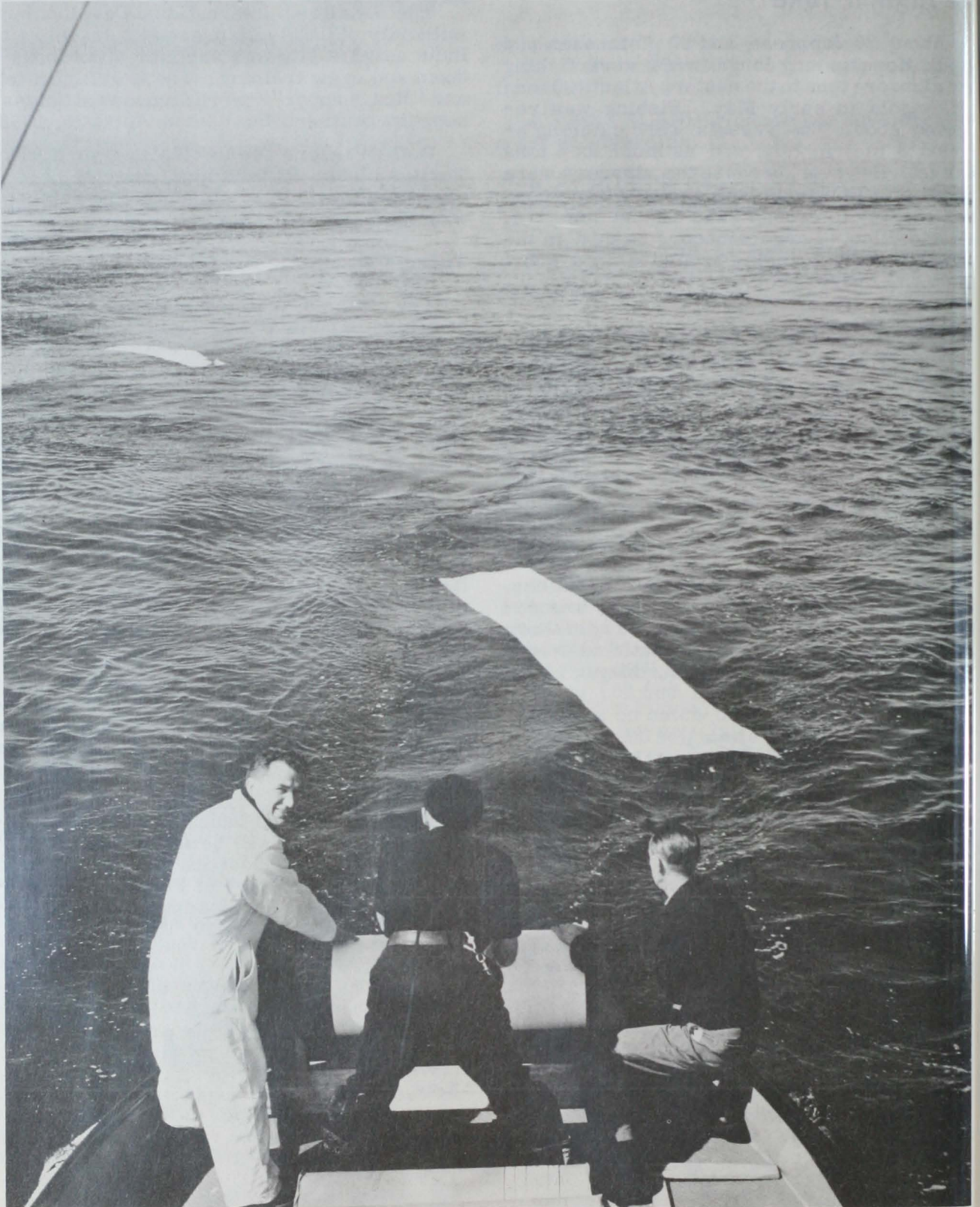
Vessels for Fishermen Training

Once the trawlers have arrived in India, their uses will be determined by the Indian Government. It is expected that their main function will be to train fishermen in efficient fishing methods. Also, they will be capable of supporting research in processing and preserving fish, and in marine biology and associated sciences.

The Indian crews of four per ship--1 captain, 1 engineer, and 2 master fishermen--were scheduled to arrive in Sweden around June 1. Following training, they will sail for India at the end of August with the Swedish training crews.

After arriving in India, sometime in November, both ships will be used initially in the Bay of Bengal. At least one will operate from Madras. The Ministry of Food and Agriculture will direct their operation. (U. S. Embassy, Stockholm, May 10, 1968.)





Charting ocean currents off British Columbia with strips of paper for pollution study. (Dept. of Fisheries, Canada.)

FOREIGN

CANADA

FISHERIES COUNCIL DOPTS RESOLUTIONS

The Fisheries Council of Canada, an important national industry group, held its 23rd Annual Meeting in Vancouver, May 5-8. It elected Richard I. Nelson of Vancouver president, and adopted these resolutions:

(1) Canada either should declare immediately the straight baseline as described in the Council's brief to the Government in January 1963--enclosing her territorial sea and from which her 12-mile exclusive fishing zone would be measured--or Canada should declare immediately exclusive fishing zones only in those areas.

(2) Canada should seek early convening of a Law of the Sea Conference. The Conference could resolve matters of fishing rights and jurisdiction not met by declaration of exclusive fishing zones--particularly, international acceptance of the abstention principle for anadromous fish, and the status of marine resources over the Continental Shelf.

(3) The Federal and Provincial Governments should set up machinery to combat possible pollution from marine disasters.

(4) The Federal Government, through tax incentives, should encourage installation of pollution-control facilities in industry. In those jurisdictions where a machinery tax is levied, pollution-control facilities should be exempt.

(5) Legislation should be enacted to enforce existing legislation. It should ensure that: (a) Fisheries interests are safeguarded in all proposals to discharge industrial and domestic wastes; (b) adequate budget and facilities are made available to the Fisheries Research Board to start long-range studies to determine effect of industrial and domestic pollution on river estuaries and salt-water bodies critically important to fishing industry; (c) the Federal Department of Fisheries and appropriate Provincial Pollution Control authorities establish workable means of monitoring major industrial and domestic effluents at outfall, and create deterrent penalties

to ensure that acceptable levels of outfall are maintained; and (d) the Federal Department of Fisheries should become more actively involved in formulation of a national water policy. ("Fisheries Council of Canada Bulletin," May 1968.)

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OPENS WORLD'S LARGEST SALMON-REARING STATION

The world's largest Atlantic salmon rearing station has begun to operate fully on the St. John River in New Brunswick. It is near the site of the Mactaquac power dam, a few miles upstream from Fredericton. The station can produce a half-million juvenile salmon to perpetuate salmon runs on the historic river that would be blocked by the 600,000-kilowatt hydroelectric plant.

Canada's Department of Fisheries cooperated with the New Brunswick Power Commission to sponsor the multi-million-dollar hatchery as the solution to the dam-created problem.

Salmon-Rearing Station

The 13-acre station at Mactaquac actually started to function last fall. Already, the first of future generations of salmon have been released to the rearing ponds. The 300,000 tiny salmon that emerged from the egg stage in February 1968 will be raised to the smolt or sea stage. Then they will be able to leave, in their own time, on the down-stream run to the sea.

Adult Salmon Selected

Adult salmon are trapped at the dam site. There, about 1,000 of the estimated 10,000 to 20,000 adult fish, which normally would migrate past Mactaquac, are selected for breeding purposes at the station. The remaining fish are transported in specially designed New Brunswick (N. B.) Power Commission trucks above the 60-mile-long headpond to meet needs of anglers in the upper reaches of the over 400-mile-long river and its tributaries.

This transport operation will leave 2 angling sites relatively unimpaired. They are

Canada (Contd.):

on the main river between Hartland and the Beechwood dam, and on the Tobique River beyond the dam headpond.

Salmon's Obstacle Course

If the salmon released in the Hartland-Mactaquac stretch of water successfully run the gauntlet of anglers, they can ascend the Beechwood lift. This is an electrically operated elevator-like apparatus that carries the fish over the dam. The salmon then can make their way up the Tobique dam fishway and enter the angling fishery in the waters beyond. The survivors will eventually spawn there. One reason for the special rearing facilities is that the downstream mortality of smolts imposed by 3 sets of turbines and the large Mactaquac reservoir will be heavy.

Brood Stock Collection

The brood-stock-collection phase of the Mactaquac breeding program began in June 1967 and continued through the fall salmon run in October. The best salmon and grilse (a 3-6-pound salmon with a 1-year sea life) as determined by general health, lengths and weights, were selected from each day's catch for the brood stock. Excess fish were transferred upstream to assure fish for anglers, and a natural spawning stock for the St. John River system.

Strongest "Races" Sought

Federal fisheries biologists are aiming at a scientifically controlled selective breeding program to produce the strongest possible "races" of salmon for the St. John River. It will take 3 or 4 years before it will be possible to evaluate the results of the breeding. Then, the program will become progressively more selective in order to use the age groups that yield the best results. (Canadian Dept. of Fisheries, May 22, 1968.)

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REDUCTION HERRING FISHERY CLOSURE CONTINUES

No reduction herring fishing will be allowed for the 1968/69 season on Canada's west coast, the Government announced on May 3, 1968. Although spawning reports showed improvement over those of 1967/68, the worst on record, they did not justify relaxation of total closure imposed then.

Canada's Department of Fisheries is conducting research programs to aid the fishery. Also, it is trying to examine the possible use of herring for food, particularly because of its high protein yield. ("The Fisherman" May 10, 1968.)

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FISHERMEN WILL GET EMERGENCY FINANCIAL HELP

Canada is studying conditions in the Atlantic Coast groundfish industry resulting from a depressed market for frozen fish products. The government wants to promote orderly marketing and prevent serious losses to fishermen and processors. It is prepared to give emergency financial assistance to Atlantic Coast fishermen dependent on the groundfish fishery if the 1968 season seriously depresses fishermen's incomes.

The government's deficiency payment plan will be computed on the average price per pound of catches of cod, ocean perch, and flounder received over the last 3 years.

Government Helps

The Department of Fisheries is accelerating its programs to improve the industry. It has commissioned an in-plant efficiency study to reduce processing costs. This study will be extended to production methods and trawler efficiency.

The Federal Government is cooperating with the Provinces and the Fisheries Council of Canada in sponsoring an industry study of the Canadian market for fishery products.

New export promotion schemes are being developed to supplement the already-extensive export sales programs of the Department of Trade and Commerce. Also, the Atlantic Development Board has begun an in-depth study of marketing methods of the Atlantic Coast industry in the U. S. market.

These plans are intended to make the industry capable of holding its own in the world markets.

Uncertain Market

Returns to fishermen for the balance of the 1968 season depend on the market situation. The market's future cannot now be determined, nor can the amount of government aid. (Canadian Dept. of Fisheries, May 23.)

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Canada (Contd.):

1966-67 FISH MEAL PRODUCTION
AND TRADE

Production		
	1967	1966
	. . . (1,000 Lbs.) . . .	
Atlantic Coast:		
Groundfish	76,312	83,188
Herring	97,686	51,762
Other	3,100	3,006
Total	177,098	137,956
British Columbia:		
Herring	19,356	54,362
Total meal	196,454	192,318

Source: "Monthly Review of Canadian Fisheries Statistics."

Imports		
	1967	1966
	. . . (1,000 Lbs.) . . .	
From:		
Peru	2,085	-
United States	80	12,000
Total	2,165	12,000

Source: "Trade of Canada."

Exports		
	1967	1966
	. . . (1,000 Lbs.) . . .	
Country of Destination:		
(A) Herring Meal & Pilchard Meal:		
United Kingdom	5,338	1,539
Belgium-Luxembourg	-	400
United States	69,354	71,429
Total	74,692	73,368
(B) Other Fish Meal:		
United Kingdom	16,176	24,166
Leeward & Windward Islands	42	50
Trinidad-Tobago	123	30
Guyana	42	-
United States	13,216	8,282
Total	29,599	32,528

Source: "Trade of Canada."

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VESSEL INSURANCE INCREASED

Effective June 15, insurance protection provided to commercial fishing vessels under the federally sponsored Fishermen's Indemnity Plan was extended to cover craft with a maximum appraised value of C\$25,000. This supersedes the existing insurable maximum limit of C\$15,000. The minimum appraised value acceptable remains C\$250.

Higher Costs

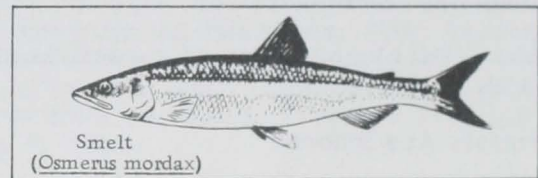
The extension results from higher construction costs, and the trend among fishermen to obtain larger craft capable of diversified fishing.

The Fishermen's Indemnity Plan agency has insured nearly 8,000 vessels in Canada with a total appraised value of C\$35 million. Over C\$19 million of this is in British Columbia. (Canadian Dept. of Fisheries, June 12.)

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SMELT IS VALUABLE RESOURCE

Smelt is a valuable resource harvested commercially all year.



More than twelve and one-half million pounds of the little silver fish were taken by Ontario fishermen during 1967, principally in trawling operations. The catch was worth well over one-half million dollars to them. The economy of Ontario benefits by at least double this amount when the value of processing and related services is included.

Much Sold to U. S.

Much of the product is sold in the United States, but Ontario retail frozen-food cabinets also are well stocked with this reasonably priced gourmet food.

Scientists have formulated effective methods of fishery management. So it is expected that this rich harvest will continue to be available for years to come--with plenty to go around for sports and commercial fishermen.



EUROPE

USSR

TRENDS IN SOVIET FISHERIES

The Soviet Ministry of Fisheries was criticized during a recent full meeting of the Central Committee of the Union of Food-Processing Workers of the USSR. Problems concerning organization of labor and increased productivity of several food-processing industries were discussed.

Speakers noted that 20 percent of all fishery enterprises failed to fulfil the 1967 labor productivity plan. The introduction of modern and mechanized equipment into the fishing industry is slow.

Most fish cleaning aboard vessels is still manual.

Scientists Are Ignored

N. Vaniaev, Fisheries Minister of the Russian Soviet Socialist Republic, said that the achievements of fishery scientists and engineers are being ignored. While East Germany's fleet is already using electric trawls designed years ago by a Soviet scientist, the gear will not be installed aboard Soviet fishing vessels until 1969.

Union speakers affirmed that the Soviet Ministry of Fisheries is generally indifferent to suggestions from innovators. On Jan. 1, 1968, over 7,000 suggestions were lying around untouched.

Construction Ministry Criticized

The Soviet Ministry of Construction also was criticized severely. The 5-Year Plan provides for construction of 1,500 food-processing plants and buildings by 1970, but actual construction lags. Only 63 percent of planned construction projects for the Ministry of Fisheries was actually built.

Other Soviet ministries fared poorly too: only 41 percent of planned construction was done for the Ministry of Power and Electrification, and 65 percent for the Agriculture Ministry.

Some Encouraging Reports

The Central Committee noted a few encouraging signs. New, well-equipped, enterprises raised labor productivity in the fishing industry by 8.6 percent during 1966-67. The ranks of "shockworkers of Communist labor" are constantly growing. Now this title is held by every 8th worker in the fishing industry. The title of "Communist crews" was awarded to 870 crews of fishing vessels. ("Ekonomicheskaja Gazeta," No. 19, May 1968.)

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FAR EASTERN FISHERY TELECOMMUNICATIONS DISCUSSED

A meeting on communications, radio navigation, and exploratory research techniques was held in October 1967 at the Fisheries Administration in Vladivostok. It was attended by inspectors of the Far Eastern fishing fleets and by representatives of the Western and the Azov-Black Sea Fisheries Administrations.

The Complaints

Many speakers criticized the poor use made of up-to-date telecommunications and radio navigation equipment, especially in exploration and research. They said: (1) many radio specialists at the Far Eastern Fisheries Administration lack the necessary theoretical background, (2) not enough radio specialists are graduating from the region's nautical schools, (3) most radio centers are unable to handle constantly increasing traffic, and (4) no refresher or advanced courses for radio specialists are available.

Reasons for Shortcomings

A resolution adopted pinpoints the causes of these shortcomings as lack of an independent agency to study fishery telecommunications problems--and an insufficient number of qualified specialists. ("Rybnoe Khoziaistvo," No. 2, 1968.)

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SSR (Contd.):

STEPS UP FISHERY RESEARCH IN POLAR REGIONS

The Polar Scientific Research Institute of Fisheries and Oceanography (PINRO) has stepped up research by its Northern Division, especially in the White and Barents Seas.

Polar Regions Research

Soviet scientists will study populations of salmon, whitefish, navaga (*Eleginus navaga*), and herring; stocks of marine mammals in the White and Barents Seas; availability of algae for commercial purposes. Other projects will try to improve Soviet coastal-fishing techniques and perfect the technology of processing fish, algae, and marine mammals.

Marine Algae

The laboratory of marine algae, headed by K. Gemn, is studying algae in the gulfs and inlets of the White Sea. Tidal electric power stations will be built there. The laboratory has studied the artificial cultivation of the *Chlorella* in the White Sea, where the natural stock of this alga is depleted. Algae are of primary importance in producing agar-agar. The latter is manufactured in the USSR by only 4 plants. The plants do not meet the needs of the Soviet economy.

The laboratory of marine mammals, under A. Golechenko, is studying seal-skin processing to improve the quality of furs.

A group of scientists headed by T. Gosheva has observed systematically herring shoals in the Gulfs of Onega and Dvina. The group established new regulations for herring fishing.

Salmon and Whitefish

Ichthyologists of PINRO's Northern Division, supervised by M. Morshtin, have investigated the population trends of Pechora salmon and whitefish. Maximum catch quotas were established to prevent depletion of these valuable species. On the other hand two fisheries experts, O. Germashev and V. Ovchinnikov, have improved techniques for intense salmon fishing in the Pechora River.

PINRO will publish soon an atlas of commercial concentrations of fish in the White Sea. ("Vodnyi Transport," May 16, 1968.)

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STERN TRAWLER COMPLETES ANTARCTIC RESEARCH

In early May, the 3,200-gross-ton research stern trawler "Akademik Knipovich" completed her third exploratory cruise to Antarctica. The expedition was headed by Dr. A. Lestev of the Laboratory for Fishing Gear and Techniques of VNIRO (All-Union Scientific Research Institute on Sea Fisheries and Oceanography).

Research involved oceanography, biology, ichthyology, and surveys for new fishing grounds in the southern seas. The Akademik Knipovich called at the Falkland and S. Georgia Islands, and Uruguayan and Argentine ports on her way home. ("Vodnyi Transport," May 7, 1968.)

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A. KNIPOVICH' STUDIES KRILL

The primary purpose of the third cruise of the A. Knipovich, which began Dec. 1, 1967, at Sevastopol, was to study krill resources in the South Atlantic. It is likely to be the last cruise to study this subject, which has engaged many VNIRO scientists for the past 4 years.

The Soviets have found it technologically difficult to make fish meal out of krill--and even more difficult to sell at home edible products experimentally produced from krill. ("Vodnyi Transport," May 7, 1968.)



Norway

THE WINTER HERRING FISHERY

The herring fishery of Norway is divided into four distinct types--small, fat, winter, and fjord herring. Winter herring are mature herring older than five years. They constitute the largest part of the total herring catch (about one-third) and are by far the most

Norway (Contd.):

valuable. The 1968 winter herring fishery was a complete disaster. The first quarter of the year is the main season.

Winter Herring Catch, Jan. -March 1966-68			
	1968	1967	1966
	. . . (1,000 Metric Tons) . . .		
Used for:			
Iced for export	2.5	15.3	17.7
Frozen for export	3.6	29.5	35.2
Salted	1.6	13.9	17.6
Smoked	0.7	4.4	4.4
Canned	1.2	7.9	8.1
Industrial use	2.4	283.4	321.8
Bait	-	0.7	3.0
Fresh domestic consumption	2.3	1.9	1.9
Total landings	14.4	357.1	409.7

Notes: (1) Original data in hectoliters (hl.)--converted to metric tons using 93 kilos=1 hl.
 (2) Totals may not add due to rounding.
 Source: "Fiskets Gang," March 7, 1968, No. 10.

POOR HERRING CATCH HURTS CANNERS

The 1968 catch of winter herring was the lowest yield recorded in this century with a total catch of about 25,600 metric tons, compared with 372,000 tons in 1967. This poor yield cannot be entirely attributed to the extremely bad weather conditions, but the fishery experts have not yet presented their views and explanations for other possible reasons. Although only about 10 percent of the year's catch was processed for fish meal and fish oil, it is a fact that Norway has had the lowest pack on record. The industry can now only rely on raw material from the North Sea herring for further production of kippers. Final pack figures are not yet available as some canners may still have small stocks of deep-frozen raw material.

The total failure of the herring catch has completely changed the picture as regards soft herring roe. Whereas in 1966 and 1967 there were surplus stocks of soft herring roe--with the exception of 1/2 ovals during the latter part of 1967--stocks are now, at the beginning of a new sales year, practically depleted, a situation which North Sea herring can in no way rectify as this type of herring does not carry any soft roe of commercial value.

In the absence of herring, the factories have been occupied with sild sardines, mostly from deep-frozen stocks of raw material.

Thus stocks of sild sardines are at present slightly in excess of stocks at the same time last year.

Estimated exports in standard cases of quarter cans of the industry's main items as of March 29, 1968, show:

	1968	1967
Brisling	72,000	98,000
Sild	272,000	234,000
Kippers	54,000	61,000
Soft herring roe	19,000	25,000

PROTAN FREEZING METHOD IMPROVED

"Protan" is the name of the Norwegian-developed process used to freeze, in alginate jelly, round herring and blocks and to glaze some fishery products. ("Norwegian Fishing and Maritime News," No. 1, 1968.)

The object is to prevent rancidity and drying out in the frozen product during long-term storage. A new-type jelly does not require special proportioning apparatus. Only a large tank with a mechanical mixer to dissolve the powder is needed. Protection is achieved by surrounding the frozen product with a coating or film of alginate jelly. This excludes air, the cause of deterioration in the quality of products during storage at normal temperatures.

The Method

Fresh fish or fillets are dipped or put into a solution of Frostgel Powder. Later, they are packed in lined frames, or in the packaging in which they will be frozen. During freezing, the solution will become jelly-like. Finally, it will become an ice-hard mass practically impenetrable to air. During thawing, the jelly returns to a thick liquid easily washed off with water.

Freezing of fish or fillets in Protan jelly must take place in plate freezers or tunnel freezers equipped to permit freezing of blocks under pressure. If freezing is not done under pressure, the fish will be forced up from the jelly during freezing and lie at the surface of the blocks without protection.

Norway (Contd.):

Basking Shark Fishery

The Norwegians have hunted the basking shark for centuries. It has always been for the liver primarily. In earlier times, however, they also used the meat--both as human food (dried) and as fertilizer--and the skin for ropes and shoes. The liver oil was used as lampfuel and for tanning. Today, it is refined into various qualities and most of it goes into the cosmetics industry. There the squalene (which basking-shark liver oil is very rich) forms a vital part of beautifying creams and lotions. The squalene is wonderful stuff, but the limited supply restricts the variety of uses. The liver oil is in high demand and brings a good price.

The Fishery

Today, the fishery is conducted by wooden boats of various types: 50-70 feet, load 20-50 tons, make 8-10 knots, and use a small whale gun. Many fishermen go after both basking shark and small whale.

The season starts in April-May, but sometimes as early as mid-March large schools of basking sharks may be spotted. The peak is usually in June, and the season ebbs in August. Sometimes September may see good catches, but at that time most catchers have switched to other fisheries--shrimp trawling, or "helpers" to the big herring purse seiners.

The basking shark is caught all along the coast of Norway, from the Kattegat to the Barents Sea, and on the banks of the North Sea. Some of our fishermen go as far as west and south of Ireland, much to the irritation of the Irish who sit on shore, waiting for the shark to come to them. The Shetland-Tampen area and the banks off Nordland and Troms are the main hunting grounds.

Little Known About Shark's Habits

Little is known about the habits of basking sharks. Two theories have been put forth regarding their migrations. As they usually are first encountered off Ireland, then on the North Sea banks, and last off northern Norway, it was accepted that the fish spent the winter in the southern part of their distribution area, and moved north in the summer to return in the fall. But closer investigations around large schools of basking shark off Finnmark sometimes as early as March, and this did not agree well with the long south-north migration theory. On the basis of new data, a new theory was formed: The fish are more

stationary. As a rule, they form various local populations within their distribution area. The whole North Atlantic, north of the tropics, and the Mediterranean are considered one distribution area. The fish stay in holes and trenches along the edge of the continental shelf in a kind of hibernating condition. They live on the energy accumulated in the liver. When the plankton blossom in spring and summer, the fish come up and over the banks to the coast.

To find the truth, we must tag the fish. Both England and Norway have tried to tag basking sharks. No experiments have been successful yet, but we hope to tag a few this summer (1968).

Equipment Used

A small whale gun is used to take the fish, but the harpoon and wire differ from whaling equipment. Figure 1 shows the rigging of the sharking equipment. The harpoon (figure 1 A) weighs 18 kilos. A steel wire of about 20 meters is fastened at its balance point. The wire is shackled to a thick, very elastic, nylon rope, and fastened about the bow outboard with easily-breakable string (figure 1 B). The nylon rope goes over a block, hanging from a gallow or standing on the rail on starboard, along the deck, over a block beside the wheelhouse and up to the winch (figure 1 C).

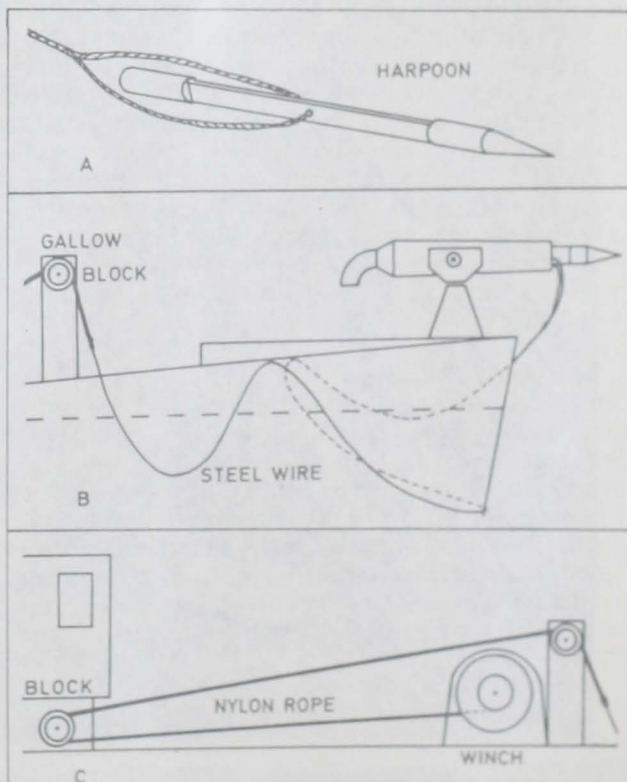


Fig. 1 (a, b, c) - Rigging of the sharking equipment.

Norway (Contd.):

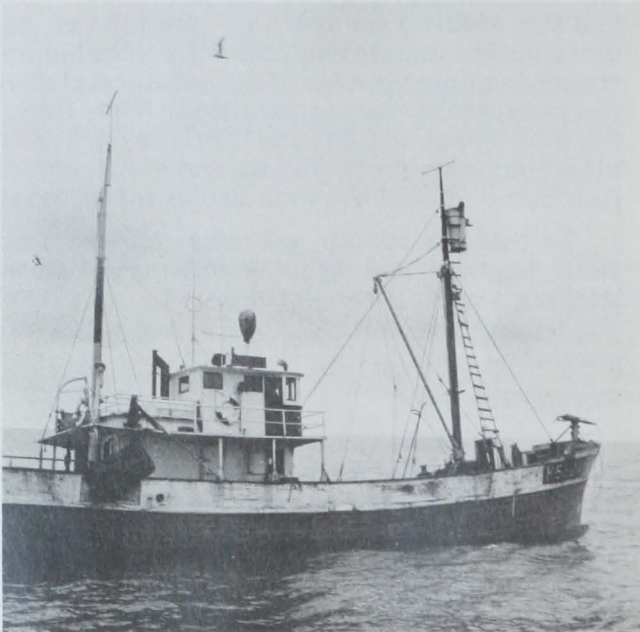


Fig. 2 - Combined trawler and basking shark hunter.



Fig. 4 - Ready to fire. Shark's shadow may be seen right under bow.

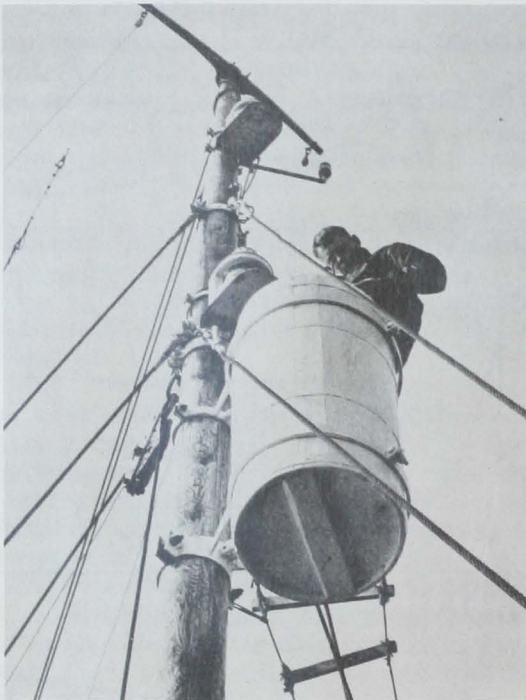


Fig. 3 - The lookout in crow's nest.



Fig. 5 - Killing shark with a carbine bullet.

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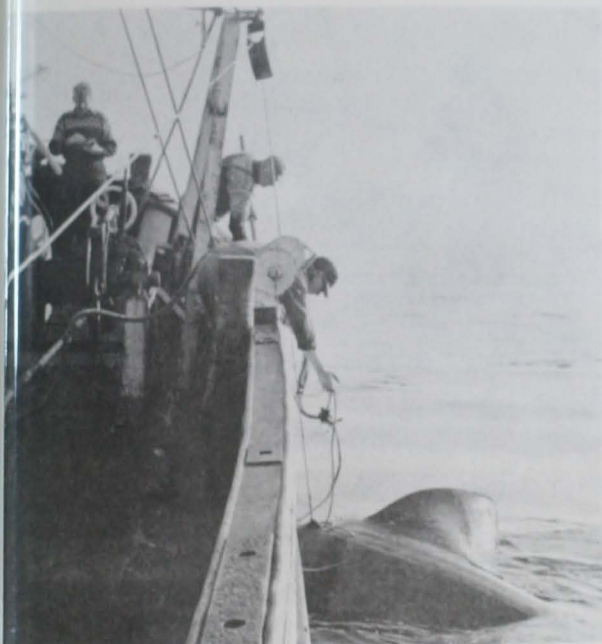


Fig. 6 - Trying to get a loop around a pectoral fin.

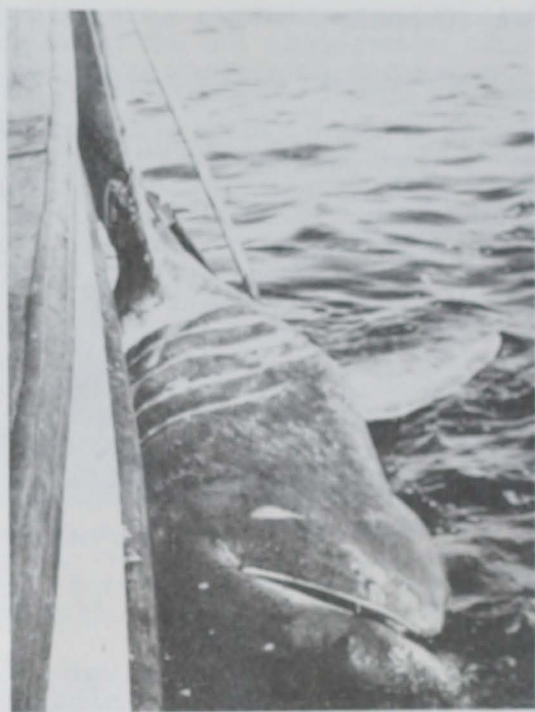


Fig. 8 - Taking out the harpoon. Skin shows uneven distribution of pigments.

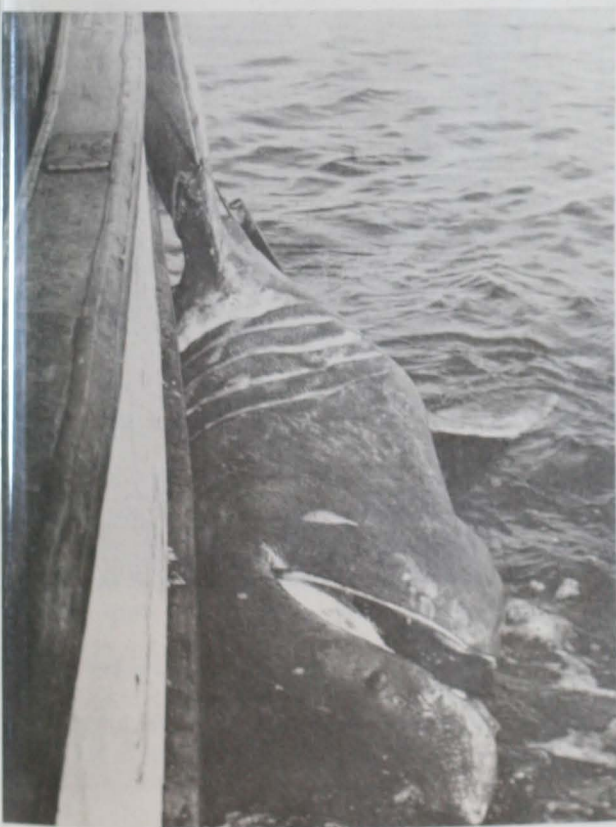
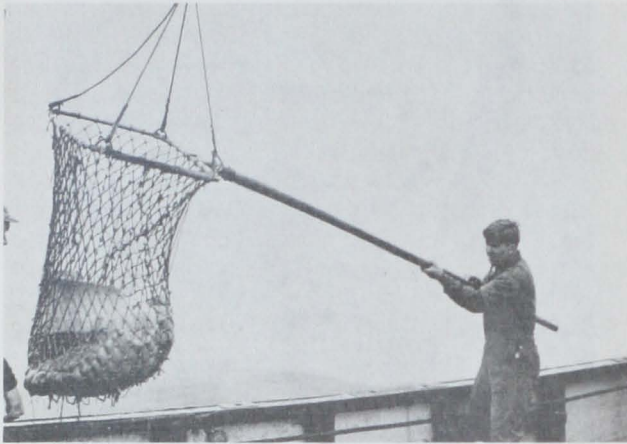


Fig. 7 - Hanging in a loop by the pectoral fin.



Fig. 9 - Cutting out the liver.

Norway (Contd.):



Figs. 10 & 11 - Heaving liver on board and dropping it into hold.



Fig. 12 - Basking shark fleet at Traena on Arctic Circle (midnight June 27-28, 1967).

Norway (Contd.):

Fishing Technique

The boats are manned by 3 to 5 fishermen, who sail out to the grounds where tradition has it basking sharks should be at the time. They also cooperate with other fishermen, who will call them by radio if they see anything. The basking shark hunters have accumulated knowledge through generations, and their strong intuition impresses an outsider. But very little has been written down.

The fishery demands good weather because fishermen depend on seeing the dorsal or upper caudal fin above water. When the wind is fresh (force 5), one usually has to give up. Everybody on board is on the lookout for the black triangle that means fish. There is a crow's nest in the main mast, and many boats also have a wind screen and an extra wheel on top of the wheelhouse, so the helmsman too gets a better view.

Shark Ahoy!

On spotting a fish or a school, the gunner runs to the bow. They close in on the fish from behind. If there is a school, they choose the hindmost fish, hoping not to scare the others down at the first shot. If the fish goes down and no fin can be seen, the lookout in the crow's nest can still direct the chase as long as the fish stays just under the surface. But that is the limit; if the fish goes deeper, the fishermen can only wait. The harpoon would lose its momentum in the water, and there is no use firing unless the fish is close to the surface.

One does not fire until close upon the fish. One aims at the thickest part of the fish, and the harpoon goes right through the body. The harpoon, which is attached to the wire at balance point, will lay at a right angle to the wire when hauled in and make a good stopper. If the harpoon does not go right through, it may be pulled back the way it went in, and the fish will be lost.

Coup de Grâce

The hauling in starts immediately. When the fish is under the starboard bow, the gunner kills it with a carbine bullet through the brain. This may be difficult and will take some time if the fish keeps its head down. All

the splashing and fighting, and the risk of being hit by the tail while leaning out over the rail, make it difficult and dangerous.

When the fish is dead, a loop is put around one of the pectoral fins, and the fish is thus turned belly up. Now hanging by the loop, the harpoon wire is shackled out. The harpoon is taken on board by a long hook, and the wire is hauled through the fish. When this is done, the gunner cleans and reloads the gun. He uses 40 grams of black gun powder. The belly is cut open by a long knife and the liver taken out. When the liver floats freely, the body is let go. The liver is cut into pieces, hauled on board, and dropped into the hold.

The whole operation, from the time trigger is pulled until crew is ready for the next fish, may take only 6 minutes under ideal conditions, I have been told, but an average of 15 minutes should be a realistic estimate.

The hunt is best in the morning and in the evening. Usually, there are few or no fish to be seen about noon. So the fishermen take 2-3 hours siestas and get a very welcome rest--because the fishery begins at 5 in the morning and often lasts until midnight.

The Industry

The fishermen have an organization in Brandal (Aalesund). When the boats are loaded, they contact the office, which directs them to one of the three factories that process basking shark liver oil, usually the nearest one. These factories are at Haugesund, Flesland (Bergen), and Brandal. The whole year's catch is sold beforehand at an agreed price based on 70% oil content; the price varies with the percentage.

The basking shark fishery is becoming popular as the oil price goes up. In 1967, 53 boats achieved a fine record: over 2 million kilos of liver, about the same as the record year of 1960. In 1966, 30 boats produced about 900,000 kilos of liver. The coming season may see a hundred boats on the hunt. Research should be intensified to find the optimum yield.

--By Sigmund Myklevoll
Research Assistant
Institute of Marine Research
Bergen, Norway



East Germany

RATES THIRD IN WORLD SHIPBUILDING FOR FISHERIES

The shipyards at Rostock, Wismar, and Stralsund in East Germany are continuously building new fishing and research vessels. Over 14 percent of the world's fishing vessels are built in East German shipyards. The nation now holds 3rd place in world fishing-vessel construction.

Recently, 150 fishing vessels with a total gross tonnage of 170,000 were ordered by various countries. One of East Germany's largest customers is the USSR--42 vessels were built for her in 1967. ("Vodnyi Transport," Oct. 7 and 26, 1967.)



France

STRIKES LIMIT IMPORTS OF FISHERY PRODUCTS

Strikes developed in the French fishing industry during the second half of February. They started in the Mediterranean ports to protest low prices for sardines. They spread to the North Sea industrial ports, where strikers sought to obtain proper controls over improper and uncontrolled imports of basic fishery products.

The fishermen of Marseilles requested the establishment of a compensation fund to support the sardine market, a fixed sale price for sardines, and a freeze on sardine imports.

The fishermen of Boulogne, Dunkerque, Dieppe, Fecamp, Cherbourg, and other northern fishing ports requested, under article 44 of the Treaty of Rome, that the minimum price system be extended to other fish species to give the market a "shot in the arm."

Government Acts

The strikes were settled only after the French government decided to take measures to protect the sardine fisheries; also, to establish immediately minimum import prices for 5 more fish species. On February 27, the French "Official Gazette" began publishing the new minimum import prices. At the same time, appropriate steps were taken at the European Economic Committee.

By the setting of firm controls over imports--and by regulating the domestic sardine market--the worries of the industry were eliminated. ("La Pesca Italiana," April 4, 1968.)



Iceland

SHIPBUILDING IS INCREASING

Until a short time ago, Iceland ordered nearly all her steel-hulled vessels abroad. Now the domestic building of these vessels is increasing.

Recently, 2 steel-hulled fishing vessels were launched for Icelanders. The vessels totaled over 360 gross tons. There also are plans to build 2 coastal vessels in the Akureyrar shipyard, though vessels of that size always were built abroad.

Many Icelandic fishing vessels have been built in Norway in recent years. For example, Kaarbos Mekaniska Verksted recently launched the twelfth and started immediately on a thirteenth. ("Atlantic and Iceland Review," No. 1, 1968.)

* * *

NEW OCEANIC RESEARCH SHIP PLANNED

Preparations to build a new Icelandic oceanic research vessel for launching in 1969 are under way. It is to be named "Bjarni Saemundsson," after a pioneer of Icelandic fishery research.

The vessel will be about 800 gross tons and equipped with 3 main engines driving dynamo that will provide its power. This will be the first electrically propelled vessel in Icelandic ownership.

Very Modern Vessel

The equipment is designed to eliminate vibration and provide better conditions for research on board. One novelty is mounting fish-locating apparatus on a movable platform. The platform remains level when the ship rolls, so radar search-beams are not affected. Only one other vessel so equipped has been built in Western Europe.

* * *

Iceland (Contd.):

1967 HERRING CATCH WAS LOW

In summer 1967, 160 herring vessels fished from Icelandic ports, 60 fewer than in 1966. The season's fishing was characterized chiefly by the great distance vessels had to travel to fish: often 600-700 miles from the Icelandic coast, all the way to Spitzbergen. The herring vessels also fished off Shetland and landed some of their catch abroad.

Catch Nearly Halved

In late December, the catch had reached 43,000 metric tons, considerably less than the 1966 period's 667,000 tons. Of this, about 38,000 tons were used for meal and oil and over 300,000 barrels were salted.

* * *

STOCKFISH EXPORTS DROP

The year-old Nigerian civil war has seriously affected one of the most important markets for Iceland's stockfish. By far the greatest part was sold to Nigeria, a substantial quantity to Italy, and a little to Sweden. In 1966, 8,217 metric tons were sold to Nigeria, while in 1967 only 2,188 tons. As a result, unsold stockfish now amount to 6,300,000 tons.

Producers Ask Government Help

The stockfish producers have to pay interest on loans and meet large storage costs for stocks. They do not know when, or at what price, they will sell them. So they have asked government aid.

Uncertain Future

Even if the Nigerian war ends soon, some time is likely to elapse before normality returns. Moreover, market prospects have not been improved by the recent increase of import duty on this article. An attempt has been made to find new markets for stockfish in other African states, but so far without much success.



Sweden

FISHERMEN HAVE MARKET PROBLEMS

Swedish fishermen are experiencing serious difficulties because of a poor supply of fish--North Sea herring normally landed directly in Danish ports--and low prices in domestic and foreign market. Representatives of fishery organizations claim that Swedish fishermen during the last two years have suffered a 30-percent reduction in salary.

The present situation is considered the most critical for fishermen in 30 years. Relatively large investments in craft and gear have resulted in severe effects in many cases. Owners of large steel trawlers report that income during the last few months did not cover interest on loans which, in many cases, exceed US\$193,000.

Foreign Devaluation

The marketing difficulty is not the only problem. Reportedly, fisheries in other Western European countries have encountered sales difficulties and low prices, both for fresh fish and prepared fish products. Swedish fishermen claim that one reason for the severe situation is the increasing import of fish and fish products. The devaluation in Denmark, Iceland, and Great Britain last fall has resulted in rapid expansion of imports from these countries. Direct landings in Denmark by Swedish fishermen are now less profitable. Trade in fish products for 1967 produced an import surplus of US\$26.7 million, compared with only US\$14.3 million in 1965.

An example of the marketing difficulties facing Swedish fishermen was illustrated in Goteborg recently, when 25 metric tons of fish, mackerel, and cod intended for human consumption remained unsold. These had to be turned over to a fish meal plant. (U. S. Consul, Goteborg, May 6, 1968.)



United Kingdom

FISHING INDUSTRY TO GET INCREASED SUBSIDIES

The British fishing industry will receive increased subsidies as soon as details are worked out. Current proposals call for increased loans for new vessels in both inshore and herring fleets, a more lasting operational subsidy for deep-sea fleet, and elimination of scrapping restrictions. Legislation also will be introduced in Parliament to end the automatic reduction of operating subsidies in existence since 1961.

Despite these proposed increases, the industry is not quite satisfied. It wants some limitation on imports. (U. S. Embassy, London, May 18, 1968.)

* * *

MARINE OILS GAIN AT HOME

The highlight of British consumption of fats and oils last year was a considerable increase in use of marine oils (prices have been falling) and a decline in vegetable oils. Trade in fats and oils reflected the consumption pattern; imports of marine oils went way up. Two chief uses of fats and oils are in margarine and cooking fats. The switch from vegetable to marine oils is most evident.

Fish Oil Price Falls

The price of fish oil declined steadily during second-half 1967, Peruvian oil dropped from US\$142 a long ton in June to \$103 a ton in December. By April 1968, the price was down to \$93. Whale oil prices show similar downturn. A recent purchase of 16,000 tons of whale oil--half from USSR and half from Japan--reportedly cost \$103.20 a ton. This compares with almost \$144 a ton for 34,500 tons in 1967.

Marine Oil Imports Rise

Imports of marine oils during 1967 went up 60 percent--to 281,900 long tons. Purchases of whale oil and fish oil increased, the latter by 53 percent. Stocks of marine oils at year end reached a very high level of 67,300 tons, compared with 28,200 a year earlier.

Total use of marine oils in 1967 did not rise as much as imports--only 13 percent above 1966 level. Because of their improved competitive position, these oils most likely will gain in British fats and oils market. ("Foreign Agriculture," May 27, 1968.)

* * *

NEW BOOK ON FISH FARMING

"Farming the Edge of the Sea," by E. S. Iverson, is a valuable book for persons interested in sea farming. It covers the present status of the industry and describes many farmed species. It looks at the biology of each species, describes the farming procedures, emphasizes the problems encountered, and discusses expansion in the years ahead. Also, it evaluates the practicability of farming species not yet farmed.

The book is available from Fishing News (Books) Ltd., 110 Fleet St., London E. C. 4, England, at US\$10.50.



Poland

BUILDS NEW SERIES OF STERN FREEZER TRAWLERS

The Polish Design and Research Center at Gdynia has designed a new class of freezer trawlers. The first 800-displacement-ton unit in this series was scheduled for launching by the Gdynia Shipyard in May. The new (B29) stern freezer trawler is intended to fish in the North and Central Atlantic for bottom and pelagic fish. The vessel is 246 feet long, will have crew of about 60, sea endurance of 60 days, and holds with over 1,000 cubic meters of space.

The trawler has 2 continuous decks--a main and a work deck, and a 3-tier superstructure. The work deck length from stern ramp to trawl winch is about 118 feet. This simplifies handling of fishing gear. She is built and equipped to fish, process and fillet, freeze, and produce fish meal.

The propulsion machinery is remotely controlled from a console in a separate

Poland (Contd.):

soundproof control room located in the engine room--or from a console in the wheelhouse, where a trawl winch control console is also located.

Processing Fish

While designing the trawler, special attention was paid to the transport and processing of fish: (1) The transport of fish between sorting room, refrigeration space and holds, and transport of offal to fish-meal plant and of ice to the sorted fish containers, is mechanized. Different types of conveyors are used. The fish working rooms are adapted for partly mechanical sorting of fish. (2) The new trawler is equipped with vertical contact plate freezers with a capacity of 30 tons per 24 hours using Freon 12. Two Bader 33 filleting machines will also be installed. To utilize fish offal, a fish-meal plant capable of processing 25 tons per 24 hours will be provided. Two flake ice producing machines will have a total output of 16 tons per 24 hours. The fish will be kept in holds refrigerated down to -18.4° F. by Freon 12-using equipment.

The first 8 units of the new series of freezer sterntrawlers have been ordered by Polish owners. The vessels are scheduled for delivery between 1968 and 1969. ("Polish Maritime News," May 1968.)



Denmark

THE 1966-67 MARINE OIL MARKET

In 1967, production of crude marine oils, mainly herring oil, increased by 25,549 metric tons to 62,686 tons. Imports were down 2,813 tons to 20,236 tons; Iceland was the main supplier. Exports increased 28,394 tons to 62,608 tons; the United Kingdom was the main customer. Consumption declined 3,441 tons to 22,328 tons in 1967.

Production of hardened and refined marine oils and animal oils was almost unchanged in 1967. Imports increased 51 percent to 19,001 tons. Peru supplied refined marine oils, and Norway and Sweden hardened oils. Consumption increased 5,423 tons to 40,014 tons in 1967, compared with consumption of 17,965 tons in 1966.

Supply of Marine Oils, 1966-67

	Stocks Jan. 1	Production	Imports	Total Supply	Exports	Consumption	Stocks Dec. 31
..... (Metric Tons)							
MARINE OILS:							
Crude:							
Fish Oil (incl. herring oil):							
1967	5,464	62,684	19,426	87,574	62,279	21,822	3,473
1966	5,286	37,037	21,701	64,024	33,385	25,175	5,464
Whale Oil:							
1967	155	2	0	157	0	25	132
1966	130	100	0	230	4	71	155
Other Crude Marine Oil:							
1967	1/	1/	810	810	329	481	1/
1966	1/	1/	1,348	1,348	825	523	1/
Total Marine Oils, Crude:							
1967	5,619	62,686	20,236	88,541	62,608	22,328	3,605
1966	5,416	37,137	23,049	65,602	34,214	25,769	5,619
Marine Oils & Animal Oils, Hardened or Refined:							
1967	1/	2/22,000	19,001	41,001	987	40,014	1/
1966	1/	2/22,000	12,609	35,609	1,018	34,591	1/

1/Not available.

2/Preliminary.

Source: U. S. Embassy, Copenhagen, April 18, 1968.



LATIN AMERICA

SPINY LOBSTER FISHERY

U. S. Embassy reports from Brazil, Colombia, and the Dominican Republic provide these important data on the spiny lobster fisheries of the 3 nations:

Brazil

The Brazilian spiny lobster fishery is open all year, except for 2 areas where fishing is prohibited:

- (i) Between latitude 33.30° and 7.50° S., and
- (ii) Between longitude 39.7° and 38.48° W., to 3 miles from shore.

Lobsters must have a minimum size of 50 millimeters cephalothorax measurement.

The fishery includes 30 vessels of 15 meters or over, and 120 under 15 meters (49 feet). These are manned by an estimated 500 fishermen.

Recent export prices were US\$1.25 to \$1.40 a pound.

Annual catches have been:

State	1967	1966	1965	1964	1963
	(Metric Tons)				
Ceara	1/	1,103	1,559	1,332	1,592
Pernambuco	1/	707	547	423	247
Rio Grande do Norte	1/	864	1,180	1,451	1,504
Other	1/	56	44	45	191
Total	2/1,007	2,730	3,330	3,251	3,534

1/Not available.
2/Estimate.

Exports:

Year	Fresh, Chilled, or Frozen ^{1/}		Value Total Exports
	Total	To U.S.A.	
	(Metric Tons)		US\$Millions
1967	975	974	2.7
1966	1,123	1,116	3.8
1965	1,181	1,174	3.6
1964	1,577	1,573	2.6
1963	1,778	1,775	3.5

1/Fresh and chilled, probably whole lobsters, and frozen, mostly tails. No breakdown available, though bulk of exports are assumed to be mostly frozen tails.

Nominal exports, 1 to 16 tons a year, have been made to Argentina, Spain, the Netherlands, and Sweden.

Plans for Future Production

The catch has been declining due either to migration of lobsters or overfishing, or both. It is not expected to exceed 1,700 tons a year over the next 5 years. It is anticipated that 99 percent of the exports will continue to go to the U.S. (U. S. Embassy, Rio de Janeiro, May 17, 1968.)

Colombia

Little spiny lobster fishing is done on the Pacific coast. Most lobsters are caught on the Atlantic coast.

The Colombian Ministry of Agriculture reported these landings of spiny lobster:

	Metric Tons
1967	22
1966	21
1965	19
1964	17
1963	16

Export figures are not readily available. However, the following data indicate the export level. Most frozen lobsters are exported. Colombia does not can lobster.

	Metric Tons
1967	16
1966	15
1965	14
1964	13
1963	10

Laws About Lobster

Colombian law prohibits lobster fishing from April 1 to Aug. 31 in the Atlantic littoral; forbids catching, of lobsters under 25 centimeters; and requires that a certain percentage of the catch, in practice seldom more than 20 percent, be made available for national consumption. Fines for violations of the first 2 articles may range from 1,000 to 100,000 pesos (US\$80-8,000).

The Fishery

About 400 fishermen, mostly Indians from Guajira, fish lobsters. They use small boats and dive for lobsters. Current Bogota price for lobster is 32 pesos (US\$2.50) a pound.

Colombia (Contd.):

Almost all lobster fishing is done off the Guajira coast in the Atlantic, particularly in the Cabo de Vela area. Some lobster fishing is done off Tumaco near the Ecuadoran border.

The principal exporting firm is Mariscos del Caribe. Two new firms, German-owned, Langosta del Caribe, and Guajira Costa Norte, plan operations soon. (U.S. Embassy, Bogota, May 21, 1968.)

Dominican Republic

The Dominican lobster fishing season runs from Jan.-Feb. and Aug.-Dec. The number of lobster fishermen is not known, but the total number of all types of licensed fishermen is 5,364.

Prices are approximately \$0.72 per kilo (\$0.33 a lb.). The number of vessels of all types in 1967 was 1,422. There is no breakdown for lobster vessels only. Areas of greatest activity are the waters around ports of Sanchez, La Romana, and Pedernales.

Fishery Limited

Due to the narrow under sea shelf surrounding the Dominican Republic, the areas where spiny lobsters may be taken are definitely limited. As a result, there is little possibility of substantially expanding the catch. The Dominican Republic cannot be considered a potential supply source of any importance for the U. S. market. (U. S. Embassy, Santo Domingo, May 19, 1968.)

Annual Catch					
1967	1966	1965	1964	1963	1962
.....(Metric Tons)					
62.8	92.1	73.6	76.1	56.0	42.8
		Exports			
		1967	1966		
		.....(Metric Tons)			
Frozen lobster	.....	19.6	30.4		
Live lobster	.....	-	1.2		
Lobster tails	.....	1.7	1.1		

Note: All shipped to Puerto Rico in 1966; Puerto Rico and Curacao (0.2 tons) in 1967.



Mexico

NEW MARINE SCIENCES SCHOOL OPENS IN MONTERREY

On April 19, 1968, the Monterrey Institute of Technology and Superior Studies officially inaugurated a new school of marine sciences: the Escuela de Ciencias Maritimas y Tecnologia de Alimentos Guaymas. Present were 200 guests. The Rector said that the school would grant degrees in marine sciences. Through fisheries research, it would seek to provide more food (from Gulf of California) and serve the economic needs of Mexico.

The School

The new school is a 2-story, concrete building 100 yards from the sea. The first floor has an aquarium; biology lab; a food-analysis lab; and a small but good pilot plant for experimental food production. The plant includes a large storage freezer, fast freezer-dryer, a thermal dryer, and a vacuum can sealer. On the second floor are 2 spacious lecture rooms, a modestly equipped oceanographic lab, a library, offices, and physiology and biochemistry lab. The labs can accommodate about 30 students each. Almost all equipment is U. S. manufacture, with a few Japanese meters and Swiss analytical balances.

61 Students

The school has operated a full semester with 61 students and 7 teachers. Next semester there will be about 100 students. The capacity of about 200 should be reached shortly thereafter. The director is Dr. Henry J. Schafer, a Mexican, with PhD from the University of Miami.

Land Donated

The land for the school was donated by a private citizen. The Ford Foundation contributed US\$175,000, the Inter-American Development Bank US\$200,000, and the Institute the rest.

The school is well coordinated with other institutions in teaching marine sciences.



ASIA

Japan

CONTINUES ALBACORE PRICE STABILIZATION PROGRAM

The Federation of Japan Tuna Fishermen's Cooperative Associations (NIKKATSUREN) plans to implement again in 1968 the albacore price stabilization program. Under this program, developed in 1965, NIKKATSUREN buys and stores albacore when heavy summer landings threaten to reduce prices below a certain level. The fish are released later, at home or abroad, when they would not glut the market. In 1966 and 1967, NIKKATSUREN had little need to do this because of high prices.

Albacore Season Starts Slowly

This year, the summer albacore fishery is off to a slow start. The outlook is not promising. So, depending on the season's outcome, NIKKATSUREN again may not have to carry out its program.

In 1967, the organization purchased 181 tons of albacore, which were processed into canned tuna in oil and sold at home. ("Katsuo-maguro Tsushin," May 7, 1968, and other sources.)

CANNED PINK SALMON PRICE REDUCED

The Japan Canned Salmon and Crab Sales Co., Ltd., announced on April 1 an advertising allowance of US\$1 a case on canned pink salmon, No. 2 cans (1/2-lb. flat). Quotations for areas A and C (U. S. and Canada, and countries other than U. K., Australia, and New Zealand) remain at \$14 for fancy grade and \$13.50 for standard grade.

Opportunity Missed in 1967

In summer 1967, there was some demand for Japanese canned pink salmon in the U. S. If the sales company had deducted \$1 from the public quotation (trading companies wanted this), a considerable amount could have been sold there. The land packers, however, never agreed, although the ocean packers wanted to dispose the stock at the reduced price.

12 BOTTOMFISH MOTHERSHIP FLEETS WORK IN BERING SEA

The 12 Japanese mothership fleets licensed for the 1968 Bering Sea bottomfish fishery were operating full scale with the arrival of the last mothership. The latter left Japan April 27. The fleet catch, Jan.-April 1968, was about 200,000 metric tons--about 45,000 tons ahead of the same 1967 landings of 156,500 tons. There is considerable interest in whether the Bering Sea fleet this year can equal or surpass the 1967 record catch of 770,000 metric tons of bottomfish. ("Suisancho Nippo," May 1, 1968.)

The 1968 Bering Sea mothership fleet assigned catch targets are:

Mothership	Size	Catch Target
	Gross Tons	Metric Tons
"Banshu Maru No. 5"	3,678	5,620
"Kanshima Maru"	7,163	7,820
"Kazushima Maru"	3,757	2,460
"Seifu Maru"	8,269	22,700
"Oshima Maru"	Unknown	4,680
"Nisshin Maru No. 2"	27,035	127,400
"Soyo Maru"	11,192	115,990
"Gyokuei Maru"	10,357	148,140
"Shikishima Maru"	10,144	103,200
"Hoyo Maru"	14,094	121,710
"Chichibu Maru"	7,472	8,000
"Kotoshiro Maru" 1/	Unknown	Unknown
Total		667,720

1/Probably "Kotoshiro Maru No. 28" (572 gross tons).

1968 SALMON DELIVERY PRICES SET

The Japanese Northern Water Salmon Mothership Association and the National Federation of Salmon Fishing Cooperative Associations (NIKKEIREN) agreed May 13 on 1968 salmon delivery prices. NIKKEIREN represents owners of gill-net fishing vessels assigned to the salmon motherships.

Salmon Price Agreements					
Species	1968	1967	1966	1965	1964
	. . . . . (Cents/Lb.)				
Red	30.7	31.3	31.3	30.7	27.0
Chum	20.2	19.2	17.9	16.6	14.0
Pink	14.9	14.9	14.4	13.4	11.0
Silver & king	20.9	20.9	19.6	18.1	16.0

The new prices are a 0.6 U. S. cent a pound decrease for reds, and a 1-cent-a-pound increase for chums over 1967 prices. There was no price change for other species. ("Nihon Suisan Shimbu," May 17, 1968.)

Japan (Contd.):

1968 SALMON QUOTAS ALLOTTED

The 1968 Japanese salmon catch quota of 93,000 metric tons was set at the recent annual meeting of the Japan-USSR Fisheries Commission. It was allocated for Area A (North of 45° N. latitude) and Area B (South of 45° N. latitude) as follows:

Area	Type of Operation	Catch Quota		
		1968	1967	1966
. . . (Metric Ton) . . .				
A	Mothership fishery	37,763	42,635	38,981
	Land-based gill-net fishery	8,737	9,865	9,019
	Total	46,500	52,500	48,000
B	Land-based gill-net fishery	27,420	33,000	28,390
	Land-based long-line fishery	12,180	14,700	12,610
	Land-based vessels under 7 tons	3,950	4,400	4,000
	Japan Sea gill-net fishery .	2,950	3,400	3,000
	Total	46,500	55,500	48,000
Grand Total		93,000	108,000	96,000

("Nihon Suisan Shimbun," May 17, 1968.)

* * *

SALMON MOTHERSHIPS DEPART

Eleven Japanese salmon motherships, accompanied by 369 catcher vessels, departed Hakodate, southernmost Hokkaido, on May 15, 1968, for the fishing grounds in the Bering Sea and North Pacific Ocean. ("Nihon Suisan Shimbun," May 17, 1968.)

Name of Mothership	Size	Owner
	Gross Tons	
"Shinano Maru"	9,048	Nichiro Gyogyo
"Chiyo Maru"	7,149	Taiyo Gyogyo
"Nojima Maru"	8,815	Nihon Suisan
"Meisei Maru No. 2"	9,356	Nichiro Gyogyo
"Jinyo Maru"	7,161	Hokkaido Gyogyo Kosha
"Kizan Maru"	8,622	Nichiro Gyogyo
"Meiyo Maru"	7,152	Hakodate Kokai
"Kyokusan Maru"	10,757	Kyokuyo Hoge
"Otsu Maru"	8,033	Hoko Suisan
"Miyajima Maru"	9,612	Hokoku Suisan
"Meisei Maru"	8,571	Nichiro Gyogyo

* * *

FROZEN TUNA EXPORTS DECLINED SHARPLY IN 1967

The Japan Frozen Foods Exporters Association reports that frozen-tuna exports in business year 1967 (April 1967-March 1968) declined sharply. Shipments to the U. S., based on exports approved by the Association,

were 67,787 short tons, down about 30,000 tons from BY 1966 exports of 98,955 tons. The decline is attributed to slow sales in early 1967 and to the record 1967 U. S. skipjack catch of about 103,000 tons.

Exports to Europe Decline

Exports to Europe also dropped sharply. These were 35,536 metric tons, compared with 52,000 tons in BY 1966. Much of this was due to reduction in direct exports from Japan because local demand for tuna was brisk. Direct exports in BY 1967 to Italy declined by about 13,000 tons, and to Spain by 5,000 tons, from BY 1966.

To Overseas Bases

Exports to overseas bases in BY 1967 were about 16,400 metric tons, down about 5,000 tons from BY 1966. This resulted largely from tuna fleet expansion by South Korea and Formosa, and to reduction of Japanese overseas-based fleet. Exports to American Samoa alone decreased by about 3,000 tons from BY 1966. ("Nihon Suisan Shimbun," May 20, 1968.)

* * *

SUMMER ALBACORE TUNA FISHERY IMPROVES

The Japanese summer albacore tuna fishery, off to a slow start in early April, is improving. Landings at the leading tuna port of Yaizu still lag far behind 1967's--4,108 metric tons during April 1-May 29, 1968, compared with 8,292 tons in 1967 period. But vessels were returning to port in late May with larger albacore catches. So prices have dropped somewhat.

Prices Drop Slightly

On May 29, pole-caught albacore of 37-40 pounds were sold at US\$469-474 a short ton, ex-vessel, compared with earlier prices of around \$500 a ton. In view of improved prospects, one Yaizu tuna packer, who had agreed to a rotation system of buying to keep prices from advancing further, decided to discontinue the practice. ("Suisancho Nippo," May 30.)

* * *

Japan (Contd.):

YAIZU'S APRIL LANDINGS RISE

April 1968 fish landings at Yaizu totaled 16,368 metric tons worth about US\$6.13 million, according to the Yaizu Fishery Cooperative Assoc. Compared with April 1967, this was an increase of 1,624 tons and \$580,000. ("Suisancho Nippo," May 9, 1968.)

	Quantity			
	1968		1968	1967
	April	March	Jan.-Apr.	April
	. . . . . (Metric Ton)			
Tuna:				
Bluefin ^{1/}	5,133	4,906	18,859	4,734
Albacore	1,241	1,521	3,958	2,412
Skipjack	5,686	4,717	17,981	3,206
Mackerel	3,650	5,288	13,783	3,757
Others	658	570	2,255	635
Total	16,368	17,002	56,836	14,744
	Average Price			
	1968		1968	1967
	April	March	April	April
	. . . (US\$/Short Ton) . . .			
Tuna:				
Bluefin ^{1/}	617	670	570	
Albacore	406	358	405	
Skipjack	242	214	258	
Mackerel	88	93	96	
^{1/} Includes yellowfin and big-eyed tuna.				

* * *

FROZEN TUNA EXPORT PRICES
TO U. S. IN MAY

The Japan Frozen Tuna Exporters' Assoc. reported these May frozen tuna export prices to U. S.:

Species	Prod.	Low	High	Avg.
		(US\$/Short Ton f.o.b. Japan)		
Albacore	Rnd.	460 (380)	470 (410)	465 (404)
Yellowfin	gilled & guttled	354 (320)	380 (395)	373 (339)
Albacore	loin	940 (806)	975 (850)	952 (837)
Yellowfin	loin	820 (722)	835 (770)	829 (753)
Note: May 1967 prices in brackets. Source: Fisheries Attaché, U. S. Embassy, Tokyo, June 7.				

* * *

INCREASES TRAWLING
OFF U. S. EAST COAST

In mid-March 1968, the Japanese Nihon Suisan Fishing Co. sent its 2,500-gross-ton trawler "Kiso Maru," based at Las Palmas, off the U. S. east coast to explore its commercial potential. In April, that firm sent another 2,500-ton trawler ("Kaimon Maru") on a similar expedition. On May 8, Nichiro Gyogyo's "Akebono Maru No. 51" (1,500 gross tons) left Shimonoseki for exploration off Florida coast. A Nichiro-affiliated firm is expected to send its trawler "Chitose Maru No. 18" (1,800 gross tons) to that region. Taiyo Gyogyo was scheduled to dispatch its 1,800-ton trawler "Taiyo Maru No. 65" from Las Palmas on May 10; in late May, 1 or 2 more expeditions were planned. Nihon Suisan also plans to send one more vessel. Thus, 8-9 commercial trawlers will be exploring off U. S. east coast this year.

1966-67 Explorations

The U. S. Atlantic coast was explored in 1966 by Taiyo's "Taiyo Maru No. 32" (369 gross tons) and, in 1967, by Nihon Suisan's "Kaimon Maru" (2,500 gross tons) operated under charter to the Japan Overseas Trawlers Association. Taiyo's expedition was disappointing, but Nihon Suisan's trawler discovered good trawlable grounds; in particular, the abundance of butterfish and squid near 30° N. latitude off New York revealed feasibility of commercial operations.

Questions remain: (1) Are the fishing grounds broad enough to support simultaneous operations of about 10 Japanese trawlers? (2) To what extent can Atlantic-caught butterfish and squid be sold in Japan? (3) Can the region be fished on sustained basis in competition with other foreign vessels? (4) Can trips be shortened to reduce costs? These and other problems involving marketing must be resolved before the region can be developed into a third major area for the Japanese trawler fleet. ("Minato Shimbun," May 9, 1968.)

* * *

Japan (Contd.):

CONTAINER SHIP LAUNCHED

Japan's first container ship, the 16,800-gross-ton "Hakone Maru," was launched May 17, 1968, at the Mitsubishi Heavy Industries Shipyard. Scheduled to be placed in service from Sept. 1 this year, she will call at San Francisco and Los Angeles on her first trip to North America.

The Hakone Maru will transport frozen tuna and other frozen fishery products to the U. S. She will carry back such imports as shrimp, beef, and lemons. The vessel has a carrying capacity of 15,800 tons, will carry 266 containers on deck, and has top speed of 26 knots.

She is one of 6 Japanese container vessels scheduled for the North Pacific route this year. ("Suisan Keizai Shimbun," May 21, 1968, and other sources.)



Thailand

U. S. AIDS INLAND FISHERY DEVELOPMENT

The U.S. Agency for International Development (AID) plans about \$250,000 in technical fishery assistance, from mid-1968 through 1971, to the Thai Government in the "sensitive" Northeast Provinces. Thailand's contribution will be about \$1 million: \$211,000 in counterpart funds, and \$750,000 in budget authorizations.

The project's purpose is to increase fresh-water fish production in the Northeast Provinces. This would increase the supply of high-protein food and the cash income of farmers. AID proposes to expand and improve the capabilities of the 8 Northeast provincial fishery stations; promote better training programs; expand research at the Bangkok Central Research Station, and survey the Northeast for areas suitable for small-scale fish culture.

Proposed Extension Service

Plans include establishment of an extension service. Eight 3-man mobile units will be set up to demonstrate the best use of irrigation for rice paddy fish culture, pond and

floating-basket pisciculture. Advice and training on fish culture will be provided. Fish fry will be supplied to village farmers at the lowest possible cost. (Present cost: \$10 per 100 fry.)

Proposed Research

In the research proposed by the plans, specialists will experiment at the Aquiculture Section at Bangkok; study methods of breeding species of fish suitable for production in Northeast Thailand; survey the prospects of making natural bodies of water suitable for fish culture.

The AID project aims at increasing fishery consumption in the Northeast in a relatively short time through effective extension work. Fish consumption now represents only 6 percent of the area's total protein requirement; in the Central Plains, fishery products already provide as much as 54 percent of all protein needs.

Mobile Units to Reach Many

The mobile units are expected to reach 250,000 to 500,000 villagers, in addition to those reached by the fishery stations. They are also expected to triple the fry distribution. In 1967, the stations distributed 2.25 million fry. During 1968-71, extension and research specialists at each station will receive more training in planning construction of fish ponds with village leaders, and in instructing farmers to breed fish in ponds and paddies. Planned for 1968-70 are 1,000 field demonstrations in pond and paddy fish culture.

Experimental fish culture in rice paddies has already been quite successful because farmers have paddies and need not wait for excavation of ponds. Experience shows that 55 to 1,250 pounds of fish per acre of rice paddy can be grown.

The Thai Department of Fisheries has already long-term plans for fresh-water fishery development. The target now is to increase annual production by 16 percent, from 86,000 metric tons in 1965 to 100,000 tons in 1971. Most of this increase will be generated in the Northeast.



Malaysia

BRUNEI PROMOTES FISHERIES RESEARCH

The Brunei (Malaysia) Fisheries Department's program to survey the deep-sea resources outside Brunei waters is now well underway.

A research trawler of the Malaysian Government was chartered by the Brunei State Government to conduct the survey in mid-April 1968. Another survey was scheduled to take place off Brunei by June 1968. During the 14-day survey in April, local fishermen were taken on board to learn about trawler fishing.

Dr. Birkenmeier, the Brunei State Fisheries Officer, said the survey will be repeated 3 to 4 times a year to determine the feasibility of trawler fishing off Brunei. Development of deep-sea fishing will depend greatly on the present survey's outcome.

All trawling was conducted outside the 3-mile territorial limits to avoid traditional fishing.

Pond Culture

Another program--construction of a fish-farm in the Sungai Jambu area near Brunei Town--is also progressing well. Initially, 23 ponds will be built to produce fish fry for distribution to pond owners in the State. Tilapia, lampam jawa, and gourami species will be used. Experiments to find out the suitability of other species for pond culture will also be undertaken at the Sungai fish farm.

Fisheries Department plans provide for facilities to demonstrate the construction of fish ponds, their maintenance, and the principles of stocking and other aspects of proper fisheries management.

Since Birkenmeier's arrival in Brunei a year ago, fisheries have become active. Birkenmeier, an Austrian, was recruited by the U. N., although Brunei pays his full salary. (U. S. Consulate, Kuching, April 19, 1968.)



South Vietnam

FISHERIES WERE NOT AFFECTED BY TET OFFENSIVE

South Vietnam's Fisheries Directorate surveyed the effects of the recent Viet Cong offensive on marine and freshwater fisheries.

In general, marine fisheries were affected only slightly. Landings remained normal. Only a few privately owned fishing vessels were destroyed.

A market survey on May 22, 1968, reveals fishery retail prices about 15 to 20 percent higher than pre-Tet prices. There has been a continuing decline in retail prices since the peak reached immediately after Tet.

Fish Hatcheries Damaged

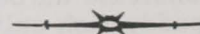
Five of the 9 freshwater fish hatcheries were damaged in varying degrees: almost 80 percent for hatcheries at Hue, Banmethuout, Bing Duong, My Tho, and Ving Long; 40-percent damage at Dalat and Thu Duc. Facilities and equipment were destroyed, and adult breeders lost. Resettling refugees on fish hatchery stations is hindering return to normal. Besides the Tet offensive, military offensives will further set back fish-hatchery facilities. This is particularly true at the Thu Duc fish hatchery near Saigon.

During January-April 1968, about 250,000 fingerlings were distributed, compared with 620,000 fingerlings in the 1967 period. Last year's distribution of 1.6 million fingerlings probably will not be reached under present conditions. The number in 1968 may not exceed one million.

It will not be possible to achieve the planned 10-percent increase in production of freshwater fish. Production may decline as much as 10 percent.

The Prospects

The marine fishing industry possibly will approach a 5-8 percent increase in total catch. At best, freshwater fish and pond-reared fish catches probably will reach no more than last year's 54,000 metric tons. The destruction of fish hatcheries will curtail fingerlings distributed. The number of new ponds constructed probably will remain low. Delta flooding, always an unknown factor, has a great influence on the tonnage of freshwater fish caught in any year. (U. S. Embassy, Saigon, May 31, 1968.)



Taiwan

TUNA SALES COMPANY FORMED

The China Marine Trading Co., a government-backed tuna sales firm formed by the Taiwanese tuna industry, was scheduled to start operations on June 18. The company was established with an investment of US\$250,000. It will handle sales of tuna caught by Taiwanese vessels and serve as central supplier of fishing gear and bait. It also plans to operate refrigerated carriers for the fishing fleet. Future plans include establishment and operation of overseas tuna bases in the Indian and Atlantic Oceans. ("Suisan Tsushin," June 1.)

TRANSFER OF TUNA VESSELS FROM AMERICAN SAMOA PLANNED

The Taiwanese tuna fishery operators based in American Samoa plan to transfer their large refrigerated vessels to other oceans because the South Pacific catch is declining. In 1967, their vessels accounted for over 35 percent of the total tuna catches delivered to the Island.

Taiwanese Fleet

The Samoa-based Taiwanese fleet is around 70 vessels, about 40 equipped with refrigeration. The Taiwanese hope to use their large 200-gross-ton vessels in the Indian and Atlantic oceans where there is good seasonal fishing for yellowfin and albacore. They expect no trouble finding suitable bases for their operation. In the Indian Ocean, the Japanese Overseas Fisheries Company operates a large tuna base at Port Louis, Mauritius. In other areas, the Japanese trading firms are actively seeking to contract Taiwanese vessels to fish for them.

Agent for Taiwanese

The China Marine Trading Company also will represent Taiwanese vessels that land fish at Port Louis and at Tema, Ghana. ("Suisan Tsushin," May 24.)



Indian Ocean Tuna Fishery Slackens, Prices Firm

Japanese long-liners have been fishing for yellowfin in the western Indian Ocean off Mombasa, Kenya, since late October 1967. Until the fishery began tapering off recently, good catches averaging 4-5 tons per vessel per day continued for months. Their shipment back to Japan began to weaken prices there. The long-liners moved southward gradually to albacore grounds off Durban, S. Africa.

Off Durban

In the western Indian Ocean, off Durban, the albacore season normally starts in May. It continues good into late June. About 25 Japanese long-liners were fishing there in early May. So were close to 100 Taiwanese (Formosan) vessels. Japanese trading firms were said to be competing with each other to buy catches from the Taiwanese. One firm, reportedly with a refrigerated carrier vessel anchored at Tamotave, Malagasy Republic, was ready to receive the catches.

Port Louis Prices

The Japanese Overseas Fisheries Co., which manages the tuna base at Port Louis, Mauritius Island, announced it would pay the prices shown below for Indian Ocean-caught tuna delivered to Port Louis in May 1968. Excepting the price for large albacore, reduced by US\$12 a short ton, the May prices were the same as April's. ("Katsuo-maguro Tsushin," May 2; "Suisan Tsushin," May 6.)

Species	May 1968
	Ex-Vessel Price US\$/Short Ton
Albacore, round:	
Large--over 24 pounds	353
Small--under 24 pounds	257
Yellowfin, gilled & gutted:	
All sizes	302
Fillets--over 26 pounds	290
Big-eyed, gilled & gutted:	
Over 66 pounds	202
Fillets--over 26 pounds	315
Bluefin, gilled & gutted:	
Over 66 pounds	202
Fillets--over 26 pounds	264



AFRICA

South Africa

'NORWEGIAN SEINING' MAKES DEBUT

Experiments in applying Norwegian purse-seining techniques to South African conditions are being carried out by 2 South African companies.

One company, the Oceana Group, decided to charter a Norwegian seiner, complete with skipper and crew, for a South African fishing season. This vessel is operating off the west coast.

The second company, Southern Sea, decided to convert a suitable vessel that became available in Cape Town. The company acquired the "Ali," a 12-year-old, 310-gross-ton, Dutch-built, side trawler with a steel hull in excellent condition.

The Ali's length, 139 ft. 6 in. overall, makes her the biggest purse seiner owned by a South African company. Had she been designed for purse seining, her beam of 23 ft. 7 in. would have been greater. Yet her fish hold, which held 120 tons of white fish in ice in her trawling days, should take 250 or more tons of pilchards with ease.

Norwegian Seiners

The big Norwegian seiners carry a bas-boat, or towing boat, used for two main functions in their fishery. It carries an auxiliary sonar installation. When a sizable shoal has been located by the mother vessel, the bas-boat is launched to obtain at close range information on its depth, direction, and approximate speed.

Meanwhile, the seiner stands off to avoid disturbing the fish. Only when she has received the report from the bas-boat, by walkie-talkie VHF radio, does she move in to trap the fish.

The second function of the towing boat is to pull the bows or stern of the seiner out of the net if the wind tends to push her hull towards it; for this work, she is given a powerful engine.

Most Icelandic seiners, on the other hand, use their towing boat for this second role only. It does the work of a transverse thrust propeller.

Southern Sea's Bas-Boat

Southern Sea has imported an 18-ft. glass-reinforced, plastic bas-boat from Norway. Whether it will be used for one or both of these roles will be decided after experiments on the fishing grounds. The plastic boat is powered by a 95-hp. diesel, equipped with hydraulic steering, and carries its own sonar fish finder. ("The South African Shipping News and Industry Review," Mar. 1968.)



Ivory Coast

PLANS FISH IRRADIATION PROJECT

The Fisheries Department of Ivory Coast, West Africa, plans to initiate a fish-irradiation project. It awaits the arrival in a few months of a "Gamine III" irradiator modified for use with fish, fruits, grains, and vegetables.

French Aid

The project will be financed by France's Fonds d'Aide et de Cooperation (F.A.C.), subject to approval by the Fonds Européen de Développement (F.E.D.). The irradiator will be shared by other scientific and developmental institutions in Abidjan. It will focus primarily on the abundant sardinellas (*Sardinella aurita* and *Sardinella eba*) and the "Fritures" (*Otoperce aurita*). Preliminary work on this project was started in 1966 by two EURATOM experts. (Regional Fisheries Attaché, American Embassy, Abidjan, May 17, 1968.)



Senegal

FISHING INDUSTRY IMPORTANT BUT GROWTH SLOW

The fishing industry of Senegal is an important part of the economy--but prospects for significant growth are not good. The industry contributes about 3% of the country's gross domestic product, 10%-12% of its export cannings, and work for about 25,000 people.

The industry is largely "traditional." About 80%-85% of all fish landed are caught by small, canoe-type, fishing boats called "pirogues" that operate close to shore. Thirty-three percent of the pirogues are powered by outboard motors, which may be bought without paying Senegalese customs duties; the remaining 67% use sails.

The boats are manned by 2 to 6 fishermen and equipped with handlines and/or small nets. The bulk of their production is sold fresh in the local markets. There are no refrigerated trucks carrying fresh fish to the interior. There are no cold storage facilities outside Dakar and a few large interior cities.

Most of the statistics in this report are extremely rough estimates by government fishing experts.

Shrimp Fishing

Shrimp fishing in Senegal has been a growing industry and still has much room for development. Fishing experts believe that both sea and river shrimp production can easily be tripled without danger of "overfishing." Production in the 1966/1967 season was estimated at about 1,100 tons, 160 tons more than in 1965/1966. Virtually all present shrimp production is exported to France. The shrimp processing companies, however, have indicated interest in exporting to the U. S.

The shrimp trawlers operating out of Senegal fish mainly for the *P. duorarum*, found in two distinct zones: one over a large plateau extending north from Cayar, 100 Kms. north of Dakar, to Saint Louis on the Mauritanian border; the other is over a small plateau just south of Cape Roxo on Senegal's southern border with Portuguese Guinea.

Industrial Fishing

The few industrial fishing boats supplying the processing industry are mainly French

owned. In the 1966/67 season, there were 43 French boats. They serve primarily the tuna canning industry.

Senegal has 5 fishing vessels with freezing facilities belonging to the government-owned and operated Société Sénégalaise d'Armement et de Pêche (SOSAP). These boats were acquired from France under a loan agreement. Senegal wants to increase her share of industrial fishing. She ordered 10 tuna boats from the Soviet Union under the 1965 accord. The Soviets agreed then to loan Senegal \$6.7 million for the tuna industry.

Senegal also intends to buy four more boats from France for delivery by 1973. Senegal seeks to establish its own fishing fleet of 40 vessels capable of operating year-round out of Dakar.

Industrial Marketing

Almost all of her processed fish is exported to France. Senegal's tuna exports benefit from a higher-than-world-price under a yearly established quota (11,000 tons in 1966/1967 season). Tuna production has averaged only 8,000 tons in recent years, so Senegal has been able to sell virtually all of it to France at a profit. Otherwise, the tuna industry would have faced very low world prices and had to export at a loss.

Many local observers believe that the large (15,000-20,000 ton capacity) tuna-canning complex the government is considering building with Soviet help would be a financial disaster. They say present canning facilities are operating at less than 50% capacity. In all likelihood, there will be no further action on the tuna complex until 1973. By then, Senegal may have enough boats to guarantee an adequate supply for the proposed cannery.

Main Fish-Processing Establishments

Senegal's 3 tuna canneries, SAPAL, Conserverie du Sénégal, and SCAF, are in the Dakar-Rufisque vicinity. Total production capacity is around 20,000 tons--over twice the average landed catch during the past 3 years.

The supply of fish to the canneries is strictly controlled by a Paris-made agreement. Only the Comptoir Sénégalais des Industries de la Conserve Alimentaire (COSICA) is authorized to buy tuna directly from the fishermen. Then COSICA distributes to each

Senegal (Contd.):

cannery the percentage of the French quota allotted to it. In the last two seasons, a 50% share was given to SAPAL, 30% to Conserveries du Sénégal, and 20% to SCAF. The quota eliminates any supply advantages a cannery might get if it owned its own fleet.

Fish Flour*

There is only one fish flour factory: Afric-Azote, on Dakar's outskirts. The company began in 1964 and has progressively increased production. It was 1,620 metric tons in 1966. A major expansion of plant facilities began in 1967 to raise the plant's present 2.5 ton/hr. capacity to 9 ton/hr.

The breakdown of Afric-Azote's raw materials is: 20% tuna fish leftovers from canning plants and 80% sardinella. The fish flour from tuna leftovers contains 60%-63% protein, and from sardinella leftovers 65%-68% protein. However, the company has ordered a machine from Sweden that can raise protein content of tuna leftover flour to 65%-68% and of sardinella flour to 70%-72%.

Afric-Azote exports all its fish flour; 95% goes to France to be used primarily as poultry feed. The 1967 F.O.B. Dakar selling price was 40 CFA/kg. (\$0.16) for sardinella flour, and 38 CFA/kg. (\$0.15) for the tuna flour.

Sardinella

Although 20%-40% of Senegal's total annual fish catch consists of sardinella, there is very little industrial processing of it for human consumption. In 1966, a small firm, the Société Africaine des Industries du Bâtiment (SAIB) undertook to can it. Virtually all its first year's production (130 metric tons) was exported to neighboring countries, which probably will remain its main customers. In Europe, the sardinella would have to compete against sardines, which have fewer bones and higher quality.

Fish Freezing and Storage

The Société des Frigorifiques du Sénégal (SOFRIGAL) in Dakar handles almost all frozen fish business in Senegal. The firm is a joint venture: the Banque Nationale de Développement du Sénégal owns 35%, André Dhellemes et Cie de Roubaix SARL 32.5%, and Star-Kist Tuna Inc. the remaining 32.5%. The plant has a 100 ton/day fish-freezing capacity, a 2,000 ton storage capacity, and an ice production capacity of 40 tons/day.

According to the official regulations governing the tuna fishing campaign, SOFRIGAL receives all frozen tuna landed in Dakar for reexport later. Since SOFRIGAL is not allowed to send more than 20% of its tuna exports to France in the form of skipjack, it may sell its excess frozen skipjack to the canneries.

*Editor's Note: This is fish meal, not fish flour or fish protein concentrate (FPC).



HOW DID SEAS, SUCH AS THE BLACK, RED, AND WHITE, GET THEIR NAMES?

Because the Black Sea is landlocked, it is deficient in oxygen, except near the surface. The high concentration of hydrogen sulphide causes a reducing environment (opposite of oxidation), resulting in a black color.

Oddly enough, the recurring bloom of small blue-green algae (Trichodesmium erythraeum) imparts the red color to the Red Sea.

The White Sea received its name from the ice that covers it more than 200 days a year.

The color of the Yellow Sea is caused by the yellow mud which is carried by rivers, especially when floods occur. ("Questions About The Oceans," U. S. Naval Oceanographic Office.)