# INTERNATIONAL

## Whale Quotas Set for 1966/67 Antarctic Season

A four-nation conference in Tokyo agreed September 7, 1966, on quotas for the 1966/67 Antarctic whaling season to begin December 1966. Effective for this season only, the total quota was set at 3,500 blue-whale units (BWU)--Japan: 1,633 units or 46.67 percent; U.S.S.R.: 1,067 units or 30.48 percent; Norway: 800 units or 22.85 percent. Great Britain decided not to whale this season but reserved the right to resume in the future.

The 1965/66 quota was 4,500 BWU, but no agreement was reached on a preseason division of the quota. The total catch was 4,089 units: Japan: 2,340 units or 57.2 percent; U.S.S.R.: 920 units or 22.5 percent; and Norway: 829 units or 20.3 percent. (Fisheries Attache, United States Embassy, Tokyo, September 7, 1966, and other sources.)

## International Pacific Halibut Commission

AREA 3A CLOSED EARLY

The International Pacific Halibut Commission closed fishing in North Pacific Area 3A on August 15. This area includes waters from Cape Spencer to the Shumagin Islands off Alaska. It was opened May 9, together with Areas 1, 2, and 3B.

The 1966 quota for Area 3A was limited to 33 million pounds, 1 million less than 1965. Because of the larger fishing fleet and lower catch quota, the 1966 season for this area was 20 days shorter than the 1965 season. As of August 11, 1966, United States and Canadian catch was 29 million pounds.

In Area 2, the catch limit of 23 million pounds was reached August 25. As of August 11, 1966, United States and Canadian catch in this area was 20.1 million pounds; in Area 3B, it totaled 1.3 million pounds. The quota for Area 3B is 3.5 million pounds.

## Fish Meal Production and Exports, January-May 1966

The member countries of the Fish Meal Exporters' Organization (FEO), which account for about 90 percent of world exports of fish meal, compiled the record below for January-May 1966. The FEO countries are Chile, Angola, Iceland, Norway, Peru, and South Africa/South-West Africa.

Table 1 - Exports of Fish Meal by FEO, January-May 1966

| Country | May 1966 | May 1965 | Jan.-May 1966 | Jan.-May 1965 |
|---|---|---|---|---|
| | (1,000 Metric Tons) | | | |
| Chile | 12.5 | 5.7 | 79.3 | 46. |
| Angola | 1/ | 1.6 | 2/14.9 | 21. |
| Iceland | 8.4 | 10.6 | 56.0 | 42. |
| Norway | 14.0 | 13.6 | 90.5 | 73. |
| Peru | 107.5 | 157.9 | 626.7 | 785. |
| So. Africa (including S.-W. Africa) | 17.6 | 23.4 | 54.7 | 89. |
| Total | 160.0 | 212.8 | 922.1 | 1,059. |

1/Data not available.
2/Data available only for Jan.-Apr. 1966.

Table 2 - Production of Fish Meal by FEO, January-May 1966

| Country | May 1966 | May 1965 | Jan.-May 1966 | Jan.-May 196 |
|---|---|---|---|---|
| | (1,000 Metric Tons) | | | |
| Chile | 27.7 | 3.8 | 115.8 | 41. |
| Angola | 1/ | 1.7 | 2/15.8 | 17. |
| Iceland | 3.8 | 7.1 | 41.5 | 34. |
| Norway | 51.8 | 27.8 | 175.1 | 107. |
| Peru | 173.6 | 127.9 | 962.9 | 786. |
| So. Africa (including S.-W. Africa) | 40.8 | 37.3 | 129.8 | 149. |
| Total | 297.7 | 205.6 | 1,440.9 | 1,135. |

1/Data not available.
2/Data available only for Jan.-Apr. 1966.

## Oceanography

### INDIAN OCEAN GIVES UP SOME SECRETS

The Indian Ocean has the hottest, saltiest water of any sea, the coldest surface water in the Tropics, and the fastest midsea current, report the scientists working with the International Indian Ocean Expedition.

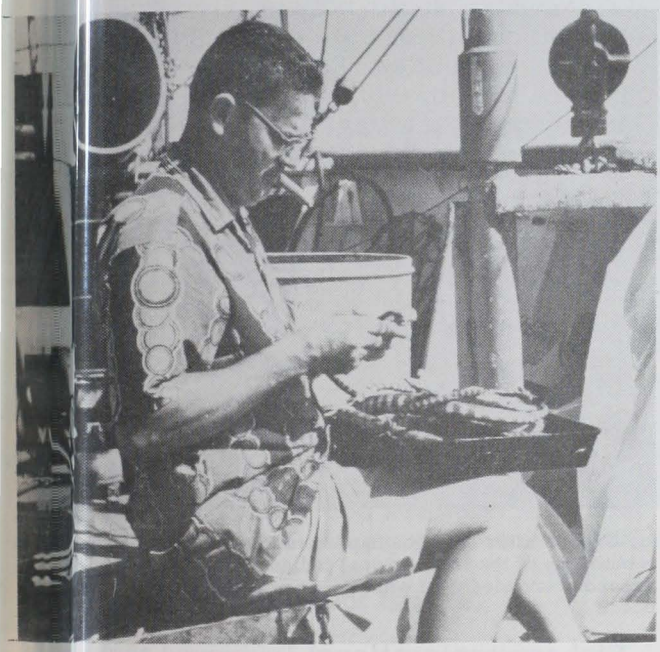

Fig. 1 - Dr. Herman A. Fehlmann of the Smithsonian Institution, Washington, D. C., sorts sea snakes brought aboard by trawl during cruise in the Arabian Sea.

Fig. 2 - Two scientists from India, working guests, remove a sea bottom sediment sample from a LaFond-Dietz bottom snapper.

From September 1959 to December 1965, 22 oceanographers from 15 nations explored the Indian Ocean using every tool at their disposal--modern research vessels, weather satellites, tramp streamers and large array of electronic gear--and gathered an unusual amount of striking information.

An Indian Ocean Meteorological Center was set up in Bombay with United Nations aid. Now the only international collection of small marine animals or zooplankton is at the Indian Ocean Biological Center at Cochin.

Fig. 3 - Sea floor sediment samples are removed from dredge and put in glass jars for analysis.

Some Exploration Findings:

The existence of the Somali Current--a "western boundary current" running north past Africa and Arabia at speeds up to seven knots--was confirmed. (The Gulf Stream in the Atlantic and the Kuroshio in the Pacific travel at a maximum of four knots.) The Somali is the only boundary current to cross the equator and the only one that reverses itself with the seasons. Only surface deep, it races north during the summer when India's southwest monsoons are raging. When the monsoons die out, it reverses its path and heads gently south.

Near the Arabian coast, where the Current turns, the water's surface temperature drops to 55° F. because of the tremendous upwelling of cold water far below. This upwelling contains nutrients from the depths. The concentration of nutrients in the western Arabian Sea is twice as high as that in the North Atlantic. The expedition's biologists were surprised to see zooplankton actually clog the nets they lowered during this period.

However, at depths of more than 200 meters, the Indian Ocean is oxygen-deficient. When the cold upwelling water is brought closer to the surface, fish are unable to survive.

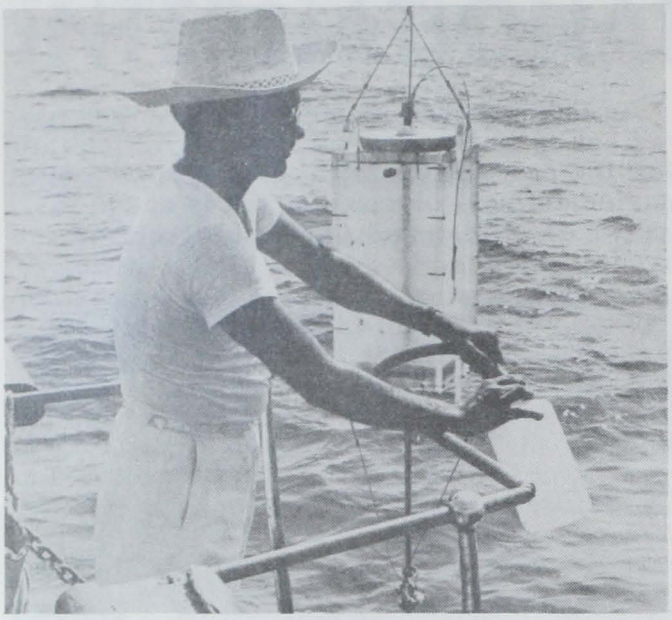

Fig. 4 - Drawing water from Dazzler sampler for trace element chemical analysis.

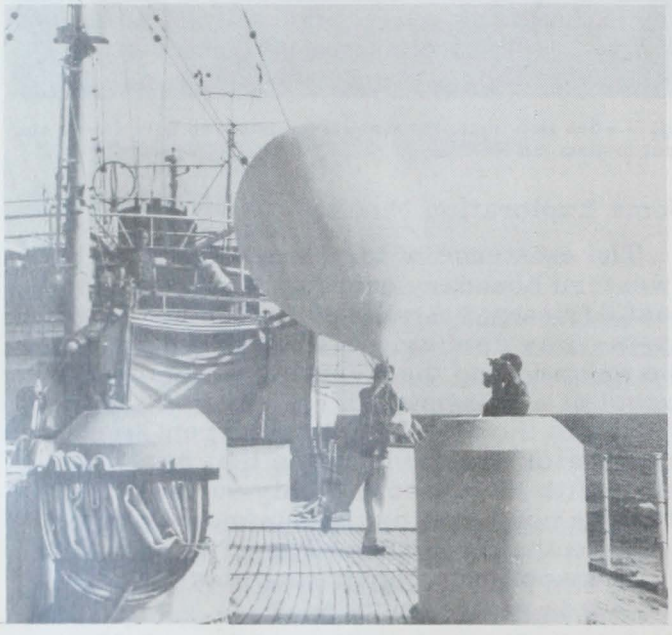

Fig. 5 - Launching weather balloon. Information from this and other sources enable scientists to gain better understanding of interaction between ocean and atmosphere. This interaction is key factor in the weather over much of the world.

Fig. 6 - Scientists lower bathyphotometer into Indian Ocean. T researchers of the International Indian Ocean Expedition greatly expanded knowledge of what goes on under, in, and above the ocean.

Fishery explorations' improved technique and more data should help increase the annual catch of fish from 2.5 million tons to 2 million within 35 years. Additional ports an modern freezing facilities will be necessary if increased catches are to reach the hungry millions. And storing and transporting fish must be updated to make the best use of scientific knowledge. (Reprinted with permission from Science News, weekly summary o current science, copyright 1966 by Science Service, Inc.)

Note: Photos were taken aboard National Science Foundation's research vessel Anton Bruun. NSF planned and coordinated United States participation in the International Indian Ocean Expedition.

# FOREIGN

## EUROPE

### Denmark

#### COD BLOCK INDUSTRY IS IMPORTANT U.S. SUPPLIER

The Danish frozen cod-block industry has been an important supplier to United States firms in recent years. The industry produces each year about 21,000 metric tons of cod blocks, and an increasing quantity is exported to the United States for use in fish sticks and portions.

The cod fishery annually produces about 68,000 metric tons (round fresh weight), according to the Danish Fisheries Ministry. Of this total, about 30 percent comes from fishing operations in the North Sea, 30 percent from the Eastern Baltic, 15 percent from the Baltic Sea, 13 percent from the Kattegat, and about 6 percent from the Skagerrak.

Seasonal catches of cod are heaviest from January through April averaging about 9,000 metric tons monthly. Later in the year, monthly catches are about halved.

Denmark also produces substantial amounts of rodspaette (plaice) and herring fillets.

The Danish Fishing Industry Association (Dansk Fiskeindustriforening), Esbjerg, Denmark, represents producers of all kinds of frozen fillets. Eleven of its members produce cod blocks. The Association covers all Denmark except the Island of Bornholm. (U. S. Embassy, Copenhagen.)

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#### HALF-YEAR DATA MADE AVAILABLE

Data provided by the Ministry of Fisheries paint this picture of the Danish fisheries for January-June 1966:

Catch: Landings of fish in local ports by Danish fishing craft were 5 percent less than during the same period of 1965. Herring landings were down 38 percent. Flatfish landings were off about 20 percent. Pond trout production was slightly below last year's record rate.

Cod landings were up 7 percent. The catch of codlike fish was up 179 percent; small haddock and whiting for reduction accounted for a large share of these catches. Landings of fish, primarily herring, in Danish ports by foreign fishing vessels declined 15 percent. Danish landings in foreign ports were more than double those of the first 6 months of 1965.

Average Prices: Average monthly prices for the main species of fish continued generally higher during the first half of 1966. Prices for plaice eased slightly in May because of good landings, but June prices were nearly the same as June 1965. Herring prices, responding to lower landings, were strong. Industrial fish prices held up as the world fish meal market continued strong. Salmon landings were about one-fourth below last year's record level, and salmon prices were very high, ranging from US$1.13 to $1.48 a pound.

Processing: The quantity of each major category of processed products, except smoked fish, was less than during the first half of 1965. Production of fresh plaice fillets was down 38 percent. With lesser quantities of herring available for reduction, production of fish meal, oil, and solubles was down 18 percent, 14 percent, and 5 percent, respectively.

Table 1 - Production of Some Processed Fishery Products, January-June 1966

| Product | Jan.-June 1966 Quantity | Change from Jan.-June 1965 | Year 1965 |
|---|---|---|---|
| | Metric Tons | Percentage | Metric Tons |
| Canned: | | | |
| Herring & sprats. . | 1,123 | - 37 | 2,805 |
| Mackerel . . . . . | 1,196 | +141 | 1,897 |
| Other fish. . . . . | 2,912 | - 1 | 3,912 |
| Crustacea. . . . . | 270 | - 65 | 1,300 |
| Mussels . . . . . | 186 | - 38 | 710 |
| Total . . . . . | 5,687 | - 5 | 10,624 |
| Fresh & frozen fillets: | | | |
| Cod. . . . . | 15,895 | - 3 | 26,596 |
| Cod-like 1/ . . . . | 1,959 | + 13 | 3,300 |
| Plaice . . . . . | 4,785 | - 38 | 17,054 |
| Other flatfish . . . | 1,112 | + 11 | 2,151 |
| Herring . . . . . | 24,929 | + 3 | 51,538 |
| Other fish. . . . . | 43 | - 58 | 114 |
| Total . . . . . | 48,723 | - 5 | 100,753 |

1/Haddock, coalfish, hake, ling, etc.
Source: Danish Ministry of Fisheries.

Table 2 - Danish Fishery Exports to the United States, January-June 1966 With Comparisons

| Commodity | January-June 1966 | | | Change from Jan.-June 1965 | | Year 1965 | | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Value | | Quantity | Value | Quantity | Value | |
| | Metric Tons | Kr. 1,000 | US$1,000 | Percentage | | Metric Tons | Kr. 1,000 | US$1,000 |
| Fresh and frozen: | | | | | | | | |
| Pond trout | 189 | 1,301 | 189 | - 47 | - 40 | 699 | 4,115 | 597 |
| Salmon | - | - | - | -100 | -100 | 50 | 491 | 71 |
| Flatfish 1/ | 53 | 570 | 83 | - 50 | - 43 | 177 | 1,858 | 269 |
| Fillets: | | | | | | | | |
| Flatfish | 12 | 58 | 8 | + 50 | + 35 | 274 | 871 | 126 |
| Cod | 4,174 | 17,899 | 2,595 | + 58 | + 70 | 10,536 | 39,331 | 5,703 |
| Other | 10 | 49 | 7 | +233 | +345 | 690 | 2,474 | 359 |
| Norway lobster | 16 | 485 | 70 | - 66 | - 57 | 167 | 4,604 | 668 |
| Other 2/ | 19 | 80 | 12 | - | - | 1 | 91 | 13 |
| Total | 4,473 | 20,442 | 2,964 | + 39 | + 32 | 12,594 | 53,835 | 7,806 |
| Salted & smoked | 6 | 27 | 4 | + 0 | - 39 | 53 | 228 | 33 |
| Canned: | | | | | | | | |
| Sprat & herring | 238 | 1,452 | 211 | - 30 | - 9 | 507 | 2,708 | 393 |
| Shrimp | 34 | 371 | 54 | - 43 | - 38 | 122 | 1,376 | 200 |
| Mussels | 70 | 353 | 51 | + 4 | + 18 | 152 | 706 | 102 |
| Other | 29 | 139 | 20 | +164 | +104 | 36 | 259 | 38 |
| Total | 371 | 2,315 | 336 | - 23 | - 9 | 817 | 5,049 | 733 |
| Semi-preserved: | | | | | | | | |
| Caviar | 20 | 247 | 36 | + 43 | + 68 | 25 | 302 | 44 |
| Other | 18 | 28 | 4 | +500 | - 30 | 8 | 119 | 17 |
| Total | 38 | 275 | 40 | +138 | + 46 | 33 | 421 | 61 |
| Fish solubles | 225 | 237 | 34 | - 50 | - 49 | 600 | 642 | 93 |
| Grand Total | 5,113 | 23,296 | 3,378 | + 22 | + 24 | 14,097 | 60,175 | 8,726 |

1/Mostly turbot, brill, plaice, and soles.
2/Includes high-unit value trout eggs and low-unit value cod.

Supplies: With the catch down, supplies of certain fish for processing were inadequate to meet demand. The controversy over increased use of foreign-caught fish continued with processors asking a more liberal policy and fishermen opposing it. The Fisheries Ministry tried to reach a compromise by allowing imports of small quantities of raw fish.

Note: See Commercial Fisheries Review, July 1966 p. 68, Feb. 1966 p. 57.

## East Germany

### FIRST "ATLANTIK"-CLASS STERN TRAWLER LAUNCHED

The first of a series of Atlantik-class universal fishing trawlers has been launched at Stralsund. A contract with the Soviet Union provides for the delivery of over 100 Atlantiks. They will replace the Tropik-class stern trawlers built in the same East German shipyard since 1962 and now to be discontinued.

The Atlantik is superior to the Tropik in several ways: higher speed, more processing capacity, and faster propulsion. The yearly output of Atlantiks, now about 23 units per year, will be raised to 30 units by 1970, according to East German plans. Some of the newly constructed vessels will probably be used by the East German fishing fleet. Like the Tropik, the Atlantik is a universal fishing vessel and can be used in both northern and southern latitudes. It is 82.2 meters (269.6 feet) long, 13.6 meters (44.6 feet) wide, with an engine of 2,630 horsepower. It can process more than 80 metric tons of fresh fish per day. The daily maximum processing capacity is 45 tons of frozen fish and 35 tons of fish meal.

## Romania

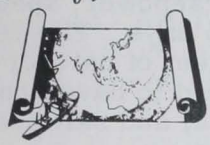
### STERN TRAWLERS REDUCE LENGTH OF VOYAGE

The Secretary-General of the Food Industries Ministry reported that Romanian stern trawlers have been able to reduce the length of their voyages to less than 120 days and still catch the planned amounts. Crews now are being trained for additional fishing vessels that will join the fleet in 1966-1970.

The stern trawler Constanta returned for unloading in July after a 110-day cruise in the Atlantic and was slated to depart soon for fishing zones south of Newfoundland. Romania's second stern trawler, the Galati, was fishing for herring off the Georges Bank south of Newfoundland.

There are new hatcheries in the Danube Delta and along the Danube. By the end of

thee ...e Year Plan (1966-1970), production of fres...ater fish in the Delta will increase to 25,... metric tons. The 1965 catch was 9,000 tons. (U. S. Embassy, Bucharest.)



## So... Union

FI...-HALF 1966
CA...H UP SLIGHTLY

...iet fishermen landed about 3.2 million me...c tons of fish, shellfish, and other aqu...c products during the first half of 1966, on... percent more than during the first half of ...5. Despite this, the sales of fishery pro...cts increased 8 percent over January-Jun... 1965. It indicates better utilization of ca... and progress in removing the bottle-nec... of recent years. (Pravda.)

...ditor's note: The growth rate of the catch du...g the first half of 1966 was the lowest sin... 1960.)

* * * * *

C...H OF PACIFIC OCEAN PERCH R... IN 1965

...viet fishermen landed 276,100 metric to... of Pacific ocean perch in 1964 and 384,000 to... in 1965. They fish for perch on three ma... grounds: the Bering Sea, the Gulf of A...a, and along the Aleutian Islands. The c...es for these 3 areas are:

| | 1965 | 1964 |
|---|---|---|
| | . . (Metric Tons) . . . | |
| ...ring Sea. . . . . | 9,100 | 10,500 |
| ...eutians. . . . . | 64,500 | 55,500 |
| ...lf of Alaska . . | 310,400 | 210,100 |
| Total . . . . . | 384,000 | 276,100 |

... 1964--103 Soviet fishing vessels (ex-...ive of support ships and including only m...um and stern factory trawlers) operated in... Pacific ocean perch fishery; in 1965, th... number was 115. In 1966, an estimated 1... 120 vessels were landing Pacific ocean p... from the three fishing grounds and, in ad...ion, some of the vessels moved south to fi... for ocean perch and Pacific hake off the co...ts of Oregon and Washington. (U.S.S.R. M...istry of Fisheries.)

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NEW OCEAN PERCH FISHERY OFF NORTH KURIL ISLANDS

In early August 1966, the Far Eastern Fisheries Administration began to fish for Pacific ocean perch off the North Kuril Islands (south of Paramushir Island). This fishery is still in an experimental stage and only 1 or 2 Sakhalin large stern freezer trawlers are fishing the area. Average daily catches run about 50 metric tons; the highest daily catch exceeded 70 tons. As a result, other vessels will probably be sent to the area. The extent of the resource is not known. It is impossible to say now how many vessels it will support.

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BUDGETS 66% FOR FISHERY INVESTMENTS

The Soviet Union plans to budget 2,921 million rubles (US$3,242 million) as capital investment in her fishing industry and fleet during the present 5-Year Plan (1966-1970), or about $650 million a year. These sums do not include funds to build houses for fishermen, fishery workers, and administrators. The level of 1966-1970 capital investments is 66 percent higher than during the 1960-1965 period--when about 1,760 million rubles (US$1,954 million) were invested in the industry (or about $352 million per year). (Rybnoe Khoziaistvo.)

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TUNA FACTORY MOTHERSHIP WORKS INDIAN OCEAN

The Soviet tuna factory mothership, the Svetlii Luch, departed the fishing base on Shikotan Island at the end of August 1966 for several months' operation in the Indian Ocean. It stopped first in the Southern Kuril Islands where a large Soviet fishing fleet catches Pacific saury to obtain bait. The species sought are tuna and, for the first time, squid.

The vessel was bought from Japan in 1965, with 4 other identical vessels, for about US$20 million. The terms were 30 percent down, the rest in semiannual payments of 5 percent of the total price. The Luch-class of tuna motherships has a capacity of about 5,300 gross tons and accommodations for a crew of 180; the vessels are 115 meters long and can operate for about 4 months without resupplying.

The Luch went on her maiden cruise to the tropical Pacific in May 1965 for about 4-5 months. The second trip began in October 1965 and ended in early April 1966. During that voyage about 400 metric tons of tuna were caught and canned.

Canned tuna is retailing in Moscow stores at 0.80 rubles ($0.89) a can (about 7 ozs.).

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## FINDS LARGE RESOURCES IN BERING SEA

Researchers of the Pacific Ocean Scientific Research Institute of Fisheries and Oceanography (TINRO) reported in mid-July 1966 completion of a series of deep-water studies in the Bering Sea. Their objective was to explore deep-water fish resources and to determine the possibility of their commercial exploitation.

They announced very promising results. Large amounts of valuable species, such as halibut, grenadier, and sablefish, were found at depths of about 225 to 300 fathoms with one-hour drags--producing about 8 metric tons of fish. Trial drags to a depth of about 400 fathoms also produced good catches. Based on their conclusions that commercial exploitation was feasible at those depths, many fishing vessels were sent to the unspecified area of the Bering Sea.

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## POLISH-BUILT FACTORY MOTHERSHIP DESTINED FOR ATLANTIC

On July 29, 1966, the B-69-type factory mothership Profesor Baranow was launched in Gdansk, Poland, for the Soviet Union. Its specifications: length overall: 164 meters (538 feet); breadth moulded: 21.3 meters (70 feet); capacity: 10,000 deadweight tons; main engine: 7,200 horsepower; speed: 15.3 knots; and endurance 75 days. The vessel's purpose is to support a fleet of catcher vessels in the Atlantic. It is said to have processing equipment for fish meal and salt herring and 2 cod-filleting lines.

The Profesor Baranow is typical of the large fishing vessels being built by the Gdansk Shipyard, which started production in 1947 with small steel fishing cutters. Since then it has developed into an important maritime center, building tankers, cargo vessels, and large fishing vessels. The yard reported its total construction had reached 2 million deadweight tons with the launching of the Profesor Baranow.

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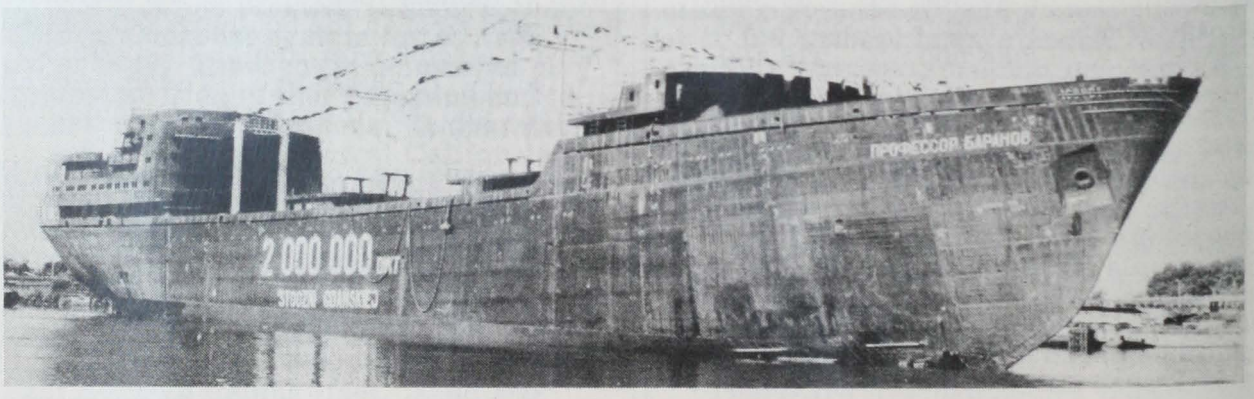
## MOVES TO EXPLOIT SOUTHWEST ATLANTIC FISHERIES

After several years of intense research along the eastern coasts of South America, the Soviet Union is moving to exploit the fishery resources of the Southwest Atlantic. Several exploratory fishing vessels have been operating on the Patagonian Shelf since early spring 1966. The catch was reportedly satisfactory.

In May 1966, a special organization was formed at Kaliningrad to plan the orderly and intensive exploitation of the southwest Atlantic fishing grounds. Called the Kaliningrad Command of the Distant Fishing Fleet (Kaliningradskaia Baza Expeditsionnogo




Factory mothership Profesor Baranow after launching at Gdansk.

Fleet, it will base its ships in the Havana fishing port. Initially, the Soviet fleet there will number 30 vessels: 15 large stern trawlers of the Tropik-class (2,600 gross tons) and 15 medium freezer side trawlers of the Maiak-class (700 gross tons). All Tropik-class vessels and most Maiaks have been delivered to the new Kaliningrad Command, though not all have been sent to Cuba. In late summer 1966, the Tropik-class stern trawlers were fishing with vessels of the Kaliningrad Fisheries Administration on Georges Bank. The medium freezer side trawlers were operating with Cuban fishing vessels on the Campeche Banks off Yucatan Peninsula in southern Gulf of Mexico.

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EXPANDS FISHERY RESEARCH

South Pacific: A new fishery research vessel, the Raduga, was delivered to the Pacific Institute for Fisheries and Oceanography (TINRO). She sailed on her first cruise to the South Pacific in August 1966 for 6 months. The Raduga is looking for demersal species off New Zealand and Australia and for pelagic species in the Indian Ocean.

According to Soviet scientists, prior research expeditions to the same area discovered large stocks of bottomfish off New Zealand. However, an estimated 70 percent of those stocks became unavailable when New Zealand extended her fishery limits to 12 miles.

North Atlantic: Two Soviet oceanographic and fishery research vessels, the Okeanograf and the Aisberg, are conducting fishery research west of the British Isles in the stream of the North Atlantic Current. The 4-month cruise began on July 1, 1966, when the Okeanograf sailed from Leningrad and the Aisberg from Murmansk. The two vessels met between Faroe and Shetland Islands to carry out simultaneous oceanographic and fishery research. It is believed this research will be of great value for Soviet fishing in the North Atlantic and confirm previous observations by other Soviet research expeditions.

The oceanographic research vessel F. Nansen left Murmansk for the Norwegian Sea earlier this year. She belongs to the Polar Research Institute for Marine Fisheries and Oceanography (PINRO) and is carrying out oceanographic research together with Icelandic and other Soviet research vessels. Some time ago, Norway, Iceland, and the U.S.S.R. concluded an agreement for joint herring research. It may be that a similar agreement has also been reached for oceanographic research, although no details are known.

Red Sea: The fishery research vessel Akademik Kovalevskii left its home port in mid-1966 for a 3-month research cruise in the Red Sea. It is affiliated with the U.S.S.R. Institute for the Study of the Biology of the Southern Seas at Sevastopol on the Black Sea. The cruise's primary purpose is to study the plankton of the Red Sea and its connections to the Mediterranean and Black Seas. It was organized by the Ukrainian Academy of Sciences (Kiev). The plankton distribution is also being studied for possible use in marine fish culture. The 630-gross-ton vessel has aboard about 20 scientists.

Constructed in 1950 in East Germany, the Akademik Kovalevskii has long been in the forefront of Soviet oceanographic and fishery research. Most of the research was conducted in the Mediterranean and some in the Adriatic Sea. In July 1964, she was the flagship of a more-than-year-long joint Soviet-Cuban expedition studying the fisheries biology of the Gulf of Mexico and the Caribbean Sea.

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CLAIMS PERFECTION OF SEMIAUTOMATIC CRAB PRODUCTION LINE

The Russians say they have perfected a semiautomatic continuous crab production line which will replace "many tens" of crab-processing workers aboard crab factoryships. Several of the lines are now being tested by crab factoryships. Presumably, the lines are also aboard vessels operating in the eastern Bering Sea.

## Spain

FISHING FLEET GROWS RAPIDLY

The Spanish fishing fleet has become one of the largest and most modern in Western Europe. Ninety-seven Spanish freezer-trawlers with a total processing capacity of 2,500 tons a day have been placed in service since 1961. These vessels constitute one-fourth of

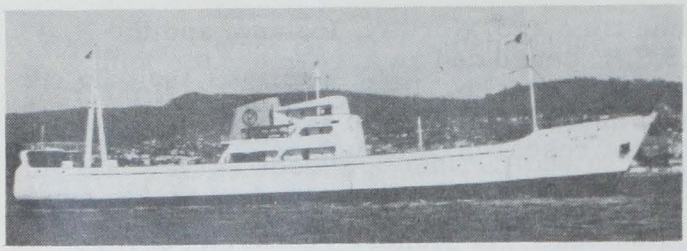

Fig. 1 - Freezer stern trawler built in Vigo, Spain, and put into service in 1963.

Fig. 2 - Freezer stern trawler built in 1965 for fishing shellfish. It is 158 gross registered tons.

Fig. 3 - Freezer stern trawler built in 1964 designed for fishing shellfish and finfish. It is 929 gross registered tons.

Distribution of Spanish Fishing Fleet by Tonnage Class, December 31, 1965

| Tonnage Class | No. of Vessels | Total Gross Registered Tons |
|---|---|---|
| Long-range fleet: | | |
| Over 500 tons | 66 | - |
| 250-500 tons | 188 | - |
| Total 250 tons and over | 254 | 135,434 |
| 150-250 tons | 614 | - |
| 100-150 tons | 541 | - |
| Total 100-250 tons | 1,155 | 182,237 |
| Total long-range fleet | 1,409 | 317,671 |
| Short-range fleet: | | |
| 50-100 tons | 1,048 | - |
| 20-50 tons | 1,417 | - |
| Total short-range fleet | 2,465 | 124,754 |
| Grand Total Fleet | 3,874 | 442,425 |

the total gross tonnage of the long-range Spanish fishing fleet. Under the Law for Renovation of the Fishing Fleet, the Spanish Government provided credits during 1961-1965 of $78 million for building 383 new vessels. During 1965, 173 of those vessels put to sea. (U. S. Consul, Bilbao.)

## United Kingdom

### BUYS LARGE FREEZER STERN TRAWLERS FROM POLAND

Two Hull trawler companies have contracted with Centromor--Poland's export agent for fishing and merchant vessels--for delivery of 4 large freezer stern trawlers. The 208-foot trawlers are the first such vessels ordered in non-British Shipyards and brings to 10 the stern trawlers on order by British fishing companies in British and non-British yards. The reasons for using Polish shipyards at Gdynia are low and fixed prices and guaranteed delivery dates (mid-1968).

The trawlers are the B-28 type, with crew of 28, an endurance of 55 days, daily fish-freezing capacity of 30 metric tons, and storage holds with capacity of 350 tons. The contracted price was not reported. (Fishing News.) French companies also ordered an unspecified number of B-28 trawlers from the same Polish shipyards.

## Yugoslavia

### ENTERS ATLANTIC TUNA FISHERY

The first Yugoslav high-seas tuna clipper, Jugoatlantik-I, arrived at Abidjan, Ivory Coast, August 9, after her maiden voyage near Annobon Island (off Gabon). She had 50 tons of yellowfin and skipjack. Built at Pula Shipyards in Yugoslavia, she will be joined by 2 sisterships off West Africa.

Vessels of the Jugoatlantik-class are 47 meters (153 feet) long and 9.5 meters (30 feet) wide. They are equipped with 1,100 by 117 meter (3,608 by 383 feet) purse seines, powerblock and hydraulic winch, and 15-ton diesel-powered steel hull seine boat. The 5-hold capacity is 425 metric tons.


Thes[illegible]foot Tuna Clipper Jugoatlantik which is first of 3 U. S.-sty[illegible]ugoslavian tuna vessels to arrive in West African waters. (Photo by Regional Fisheries Attache)

[illegible] Yugoslavs plan to land the catches of thee[illegible]una vessels at Abidjan, Monrovia, Fr[illegible]own, and Dakar--depending on which po[illegible]s closer to area of operations. (U. S. Em[illegible]ssy, Abidjan.)

## A[illegible]

## Jo[illegible]n

### F[illegible]EN TUNA EXPORTS TO U. S. RISE

[illegible]e Japan Frozen Foods Exporters Asso-ci[illegible]an reports that 35,595 short tons of fro-z[illegible]na were exported to the United States A[illegible]- June 1966--compared to 32,782 tons fo[illegible]e same period in 1965. Exports of tuna to[illegible]erseas bases, such as American Samoa, in[illegible]sed substantially from 1,990 short tons in[illegible]5 to 6,293 tons in 1966. (Suisan Tsu-s[illegible])

Japanese Frozen Tuna Exports, April-June 1966

| Type | U.S. | Overseas Bases | Other Countries | Total |
|---|---|---|---|---|
| | . (Short Tons) . | | . (Metric Tons) . | |
| [illegible] | | | | |
| [illegible]core[1/] . . . . . | 13,544 | 3,944 | 1,404 | 17,266 |
| [illegible]owfin[2/] . . . . . | 15,574 | 1,925 | 7,249 | 23,121 |
| [illegible]e[2/] . . . . . | 1,218 | 417 | 3,804 | 5,287 |
| [illegible]a ck[1/] . . . . . | 3,816 | 7 | 276 | 3,743 |
| [illegible]fin[2/] . . . . . | - | - | 458 | 458 |
| [illegible] . . . . . | 1,443 | - | - | 1,309 |
| [illegible]Apr.-June 1966 . . . | 35,595 | 6,293 | 13,191 | 51,184 |
| [illegible]Apr.-June 1965 . . . | 32,782 | 1,990 | 19,202 | 50,740 |

[illegible]nd fish.
[illegible]ed and gutted, dressed, and fillets.

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### ALBACORE SEASON POOR, SKIPJACK EXCELLENT

The 1966 summer pole-and-line albacore tuna fishery ended poorly as predicted. The season's landings were a low 18,000 metric tons through June. Total landings are actually less because the 18,000 figure includes 3,000 tons of "spring albacore" taken far offshore (mainly east of 145° E. longitude between 32°-35° N. latitude) in March and April before the summer fishery started. Landings were 42,000 tons in 1965, 24,000 in 1964, and 26,000 in 1963.

The short supply of albacore pushed ex-vessel prices in Japan to a high level. Prices held steady around 171 yen a kilogram (US$431 a short ton) compared to the 1965 average price of 102 yen a kilogram ($257 a short ton).

In contrast, 1966 is an excellent year for skipjack. Landings at the principal tuna port of Yaizu for January-June 1966 totaled 29,048 metric tons--16,568 tons more than the 1965 catch for the same period. Skipjack fishing off the Sanriku coast (northeastern Japan) was reported very good. It was forecast that the summer catch there may easily exceed 70,000-80,000 metric tons--far surpassing last year's catch of 40,000 tons. (Suisancho Nippo; Katsuo-Maguro Tsushin, and other sources.)

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### SOUTH KOREA AND TAIWAN PACIFIC TUNA CATCH TO TOP JAPAN'S

South Korea and Formosa will surpass Japan in landings from the Pacific tuna fishing grounds. (Fisheries Attache, U. S. Embassy, Tokyo, from Suisan Keizai.)

A survey by the Frozen Tuna Export Association produced these figures for 1966:

Landings of Tuna

| Country | May | June |
|---|---|---|
| | . . (Metric Tons) . . | |
| Japan . . . . . | 10,890 | 11,730 |
| South Korea . . . . . | 11,000 | 12,000 |
| Taiwan . . . . . | 8,000 | 10,000 |

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## PURSE-SEINES TUNA IN EASTERN ATLANTIC

The 90-gross-ton tuna purse seiner Hakuryu Maru found good fishing. One of two vessels contracted this year by a Japanese firm to fish the eastern Atlantic Ocean, she began in late June. As of July 20, she had landed 140 metric tons--skipjack and yellowfin in about equal quantities.

The second purse seiner, Seisho Maru No. 10, 90 gross tons, has not fared well due to propeller trouble from the outset. Her catch during the same period was only 80 tons, mostly small yellowfin.

The Kuroshio Maru No. 81, 145 gross tons, assigned to the company's Chichibu Maru mothership fleet, was reported to have landed 23 tons of tuna in about a week's operation in the eastern Atlantic. (Katsuo-maguro Tsushin.)

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## CANNED TUNA EXPORTS TO WEST GERMANY DECLINE

Exports of canned tuna in oil to West Germany--its largest export market for this--declined drastically at midyear. Tight money and high interest rates in West Germany were blamed. As a result, West German buyers are said to be offering very low prices for Japanese canned tuna products, and this has largely depressed sales to that country.

From April 1965-March 1966, exports of tuna in oil totaled 765,564 actual cases, equal to 41 percent of total exports to all countries excluding the United States.

The export price of Japanese canned skipjack in oil dropped to US$7.50 per case c.i.f., declining over $1 a case since spring 1966. Exports to West Germany of a specialty-pack tuna (described as "dressing tuna") also declined, but the decline was attributed to the refusal of Japanese packers to reduce the relatively high price of that product compared with oil-packed tuna. (Suisan Tsushin, and other sources.)

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## TRANSSHIP SHRIMP FROM COMMUNIST CHINA

The Japanese trade intends to use a new method for intransit trade in spring shrimp imported from Communist China. It will prevent waste of foreign currency and not disturb the domestic market where local shrimp is oversupplied. The shrimp will be held in bond and transshipped without formally entering Japan. It is planned to transship from Kobe to Great Britain 75 tons of spring shrimp in this way, and an additional 25 tons will be transshipped to Rotterdam. (Fisheries Attache, United States Embassy, Tokyo, from Suisan Keizai.)

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## MAJOR FIRMS LOOK FOR NEW GROUNDS

Large Japanese fishery companies are trying to develop new fishing grounds to compensate for restrictions by many nations of fishing off their coasts. This search for new grounds will intensify.

The Government's Fishery Agency is reported considering construction of a large fishery survey vessel to assist the fishery industry in discovering and exploiting new grounds.

Before, companies looked for new grounds during "spare time" in normal operations. Today, they are systematizing such experimental fishing operations. These operations are becoming more costly in dwindling resources of established grounds and more urgent as national prohibitions increase.

One large company is centralizing plans for exploration. In the past, exploration was conducted individually by its fishing sections. It is also emphasizing development of techniques for improving trawl fishing, fishing for bonito, tuna, mackerel, and land-based whaling in still-undeveloped fishing grounds. It has started to improve deep-sea trawling. It hopes to advance into drag-net fishing for herring and cod in the North Atlantic.

A second company is promoting deep-sea trawling with 3,000- to 3,500-gross-ton trawling vessels. It is constructing a 550-gross-ton survey vessel primarily for developing new grounds in the North Pacific. The company now has two drag-net vessels conducting

experimental fishing for crab and fish in the Okhotsk Sea, 40 miles off Kamchatka Peninsula.

Another company is trying to expand in trawling and tuna fishing as its fishing for salmon, its chief operations so far, appears destined to decrease with the advance of the Soviets and Koreans in salmon fishing. It has developed new fishing grounds off Sierra Leone and is conducting experiments to employ seine-net fishing. It has three vessels engaged in drag-net fishing in west African waters to develop new mackerel fishing grounds.

Another firm is building up its deep-sea trawling to make up for a reduction of whale catches. It now ranks third in this field. Since 1965, it has been probing new grounds southeast of New Zealand and off the Argentine coast.

And, in June 1966, another fishing firm became the first to explore new grounds for salmon in the Arctic Sea. (The Japan Economic Journal, Tokyo.)

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## EXPANDS TRAWL FISHING IN NORTHEAST PACIFIC

The Japanese Fisheries Agency issued licenses in late July 1966 to two major companies to operate experimentally four trawlers east of 135° W. longitude and north of 33° N. latitude in the northeastern Pacific off the North American coast. The two firms already operate the stern trawlers Taiyo Maru No. 82 (2,886 gross tons) and the Kirishima Maru (3,495 gross tons) in the Gulf west of 135° W. longitude. Each of the two trawlers is accompanied by a 500-ton trawler.

Another large firm plans to conduct experimental fishing in the same area. This company operates the 3,500-ton stern trawler Takachiho Maru in the Gulf. The trawler will be joined by the 550-ton trawler Mogami Maru, which was delivered August 1. After a trial run in the Japan Sea, the Mogami Maru departed Japan around August 9.

The opening of fishing grounds east of 135° W. longitude and north of 30° N. latitude will make it possible for the Japanese Gulf of Alaska trawl fleet to operate year-round. In winter, when sea conditions are bad in northerly latitudes, the trawlers will exploit the waters farther south. The trawlers will seek hake and other species. (Suisan Tsushin; Shin Suisan Shimbun Sokuho, and other sources.)

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## REPORTS NORTH PACIFIC WHALING DATA

The catch of whales in the North Pacific passed the 60 percent mark July 25, 1966:

| | Sperm | Finback | Sei | BWU[1/] |
|---|---|---|---|---|
| Kyokuyo Maru . . | - | 567 | 764 | 411 |
| No. 3 Nishin Maru | 1,186 | - | - | - |
| Nichiei Maru. . . | - | - | - | 260.5 |

The Nichiei Maru was expected to attain her quota and then hunt only sperm whales. The Kyokuyo Maru's quota is 1,080 whales, of which 844 are finback whales; she must catch 277 finback whales and 236 sei whales to fill her quota. The problem is to catch proper ratio of finback to sei whales.

There has been no progress in talks on export price of finback whale oil. Market conditions are reported bad. New stocks may be stored in Rotterdam pending developments. It is expected that 10,000-12,000 metric tons of sperm whale oil from the North Pacific will be exported to companies in the United States and Europe at a price of US$201.60 a ton. (Fisheries Attache, United States Embassy, Tokyo, from Suisan Keizai and Suisan Tsushin.)

1/Blue-whale units.

日本

# Communist China

## BEGINS TO DEVELOP TUNA FLEET

A 319-gross-ton tuna longliner ordered by Mainland China's Technical Advancement Corporation from a Japanese shipyard at Shimizu was delivered to the Chinese owners about August 1, 1966. The vessel was taken to the port of Huang Pu (near Canton in Kwangtung Province) by a Japanese crew.

Communist China has apparently decided to enter high-seas tuna fishing. This is the first indication of the expansion of Chinese

fishery operations into areas distant from her coast. Her intial fishing bases will be the ports of her southern provinces adjacent to the South China Sea. (Nihon Keizai Shimbun.)

To train a crew for the longliners and others that may be built, the Chinese sent 6 fishery experts to Japan in July for two months of technical training in handling tuna vessels and equipment.

## Republic of Korea

FIRST VESSEL SURVEYS NORTH PACIFIC

The 389-ton training vessel Paik Kyung Ho of the Pusan Fisheries College recently completed a 3-month exploratory cruise of the North Pacific, the first ever carried out by that nation. The vessel was sent because of: (1) intensive competition on the fishing grounds off South Korea; (2) numerous international restrictions in the East China Sea; (3) a declining catch trend in the South Pacific tuna grounds where about 100 tuna vessels are operating.

The vessel was reported to be seeking such species as salmon, flatfish, and Alaska pollock. The crew consisted of 10 scientists and 34 trainees.

## Taiwan

TUNA FLEET EXPANDS

The Government of Taiwan is making available this year about US$1.7 million to help finance the development of the tuna industry. The loan is paying for purchases from Japan of used tuna fishing vessels with a combined gross tonnage of 5,000 tons. Borrowers must construct one new tuna vessel in Taiwan for every three used vessels they buy from Japan.

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SELLS INDIAN OCEAN ALBACORE IN SOUTH AFRICA

Most of the 16 tuna long-line vessels built by Taiwan under funds provided by the World Bank are operating in the Indian Ocean. Some of them were reported to have landed their albacore catches at Cape Town, South Africa for ex-vessel US$355 a short ton for shipment to Puerto Rico. (Note: Freight from Cape Town to Puerto Rico is $85 a ton.) This price is equivalent to ex-vessel $385 a short ton, delivered Las Palmas, or about $10-15 a ton lower than the price of Japanese-caught albacore landed at Las Palmas. (Suisan Tsushin.)

## Thailand

SOUTHEAST ASIAN RESEARCH CENTER TO BE SET UP

At the Southeast Asian Ministers Conference held in Tokyo earlier this year, Thailand proposed creation of a Fishery Development Research Center in Thailand to train fishery specialists to develop the fishing industries of southeast Asian countries. Thailand would provide the land and buildings; Japan the research equipment, a 500-ton fishing vessel, and 5 to 6 researchers; and all participating countries would share operating costs.

To promote the center, Japan dispatched a preliminary survey group in September to the Philippines, Thailand, Burma, Cambodia, Indonesia, and Malaysia to observe fishing conditions. Japan plans to budget about 400 million yen (US$1.1 million) for the program. (Nihon Suisan Shimbun.)

# AFRICA

## Kenya

FISHING INDUSTRY EXPANDS

The Minister for Tourism and Wildlife signed an agreement in midyear establishing the Kenya Inshore Fisheries Limited. The new company is jointly financed by a British fishing company, the Kenya Government, and local business interests. The Government intends to transfer its shares to a fishermen's cooperative--which it hopes will evolve. The Assistant Minister for Health will be company chairman.

increase production, the new firm will introduce modern fishing methods on the coast. It storage facilities to handle 50 to 60 tons of fish a month for local consumption. It will set up buying centers along the coast and small shops in Mombasa. The British company will provide technical and overseas marketing assistance.

first, the company plans to concentrate mainly on shrimp and other shellfish for which there are good domestic and foreign markets. Plans are being considered for marketing tuna and marlin, particularly in Japan, and for promoting marine fish sales in land-locked Kenya. Protective export and import licensing for shellfish has been instituted and the Government may take further action to grant the new firm a trade monopoly for certain types of fish to ensure a market and stabilize prices.

Development of the Fishing Industry: The revised Development Plan (1966-70) calls for total capital expenditure of about $1,467,000 for fisheries development and tripled production--to reach 60,000 tons a year. Average annual revenue per producer is estimated at about $389 per ton by 1970.

Expansion of the fishing industry was encouraged by favorable surveys in 1965 by two United Nations Food and Agricultural Organization teams. The teams investigated long-line fishing and marketing problems and potential for a mechanized industry.

A private Japanese group has looked into investment opportunities. In April 1966, a Japanese expert sent by his Government under the technical aid program, conducted a feasibility study. He is studying deep sea fishing and extending the FAO survey to determine profitability and means of financing expansion. Also, the East African Marine Research Organization carried out intensive studies of exploitation of fishing on the Northern Kenya coast. It estimated a potential annual catch worth about $5.6 million.

Principal problems facing the fishing industry are: inefficient operations, equipment, and marketing; limited domestic market and storage and processing facilities; high prices due to outmoded means of production; and fishermen's lack of ambition and adherence to old methods.

Perhaps the biggest obstacle is that most Kenyans do not fish because of tradition, superstition, or the fact that fish are not available in rural areas. To counteract the general reluctance to eat fish and to create an adequate demand for the anticipated increased production, the Kenya Government launched an "Eat More Fish" publicity campaign costing about $43,400. If successful, this campaign could result in the fishing industry providing substantial employment and a low-cost source of protein for the African population. However, longstanding consumption habits will be difficult to overcome. For the immediate future, most of the market for Kenya fish will be abroad. (United States Embassy, Nairobi.)

## South Africa

### INDUSTRY ASKS FOR 200-MILE FISHING LIMIT

The furor over foreign fishing fleets off the South-West Africa coast during August 1966 resulted in two separate moves to discourage foreign fleets from operating in South African fishing grounds: (1) The Transport Minister raised charges for transshipping fish in South African and South-West African harbors from about 28 cents to $19.60 per ton; (2) the retiring president of the Walvis Bay Chamber of Commerce asked the Government to extend territorial fishing waters to 200 miles--to further curb foreign fishing operations and to protect the fishing grounds until a survey of available fish resources can be made.

According to the Namib Times, more than 100 foreign trawlers operate between Cape Town and Walvis Bay and their catch exceeds 500,000 metric tons per year. The Times also reported that another giant factoryship, the Vostok, displacing 45,000 tons, is being constructed in Leningrad for the Soviet fleet and will operate in the pilchard fishing grounds off South-West Africa.

The extension of territorial fishing waters to 200 miles is an oft-heard recommendation that uses Peru as a precedent. Following hearings in South-West Africa at the end of September 1966, the survey of the South-West Africa fishing industry is expected to say something about fishing limit in its report. (United States Embassy, Pretoria.)

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PRODUCTION OF MAJOR PROCESSED PRODUCTS ROSE IN 1964-1965

Another record production of fish meal and oil was made in 1965 in South Africa and South-West Africa. As in 1964, the production of canned pilchard increased sharply. These increases were due to larger increases in South Africa. The 1964 record was due to increases in production by South-West Africa.

In 1965, both whale oil and sperm oil production increased substantially. (United States Consulate, Cape Town, and other sources.)

Production of Major Fishery Products in South Africa and South-West Africa, 1964-1965

| Product | Unit | South Africa | | South-West Africa | | Total | |
|---|---|---|---|---|---|---|---|
| | | 1965 | 1964 | 1965 | 1964 | 1965 | 1964 |
| Canned: | | | | | | | |
| Pilchard | Short tons | 72,625 | 2,332 | 69,426 | 62,130 | 142,051 | 64,462 |
| Maasbanker | " | 4,488 | 1,527 | - | - | 4,488 | 1,527 |
| Mackerel | " | 4,237 | 8,152 | - | - | 4,237 | 8,152 |
| Spiny lobster | " | 49 | - | 55 | 164 | 104 | 164 |
| Frozen: | | | | | | | |
| Spiny lobster tails | " | 3,710 | 3,325 | 2,756 | 2,730 | 6,466 | 6,055 |
| Pilchard | " | - | - | 936 | 1,020 | 936 | 1,020 |
| Industrial: | | | | | | | |
| Fish meal | " | 300,086 | 108,803 | 170,856 | 175,186 | 470,942 | 283,989 |
| White fish meal | " | 7,225 | 9,320 | - | - | 7,225 | 9,320 |
| Fish body oil | Long tons | 55,195 | 21,857 | 34,447 | 48,159 | 89,642 | 70,016 |
| Whale oil | " | 5,333 | 4,122 | - | - | 5,333 | 4,122 |
| Sperm oil | " | 12,386 | 10,778 | - | - | 12,386 | 10,778 |

## Libya

BUYS VESSELS FROM POLAND

A $3 million contract for 33 fishing vessels has been awarded to a Polish firm. The goal is to increase annual fisheries production to 15,000 metric tons.

Thirty fishermen have been trained. In Tripoli, a warehouse was opened to provide fishermen's services and supplies, and a wholesale fish market is being built.

All this is part of a five-year (1963-1968) development plan. The funds to finance the projects come from petroleum revenue. By law, 70 percent of this revenue must be devoted to economic development. (United States Embassy, Tripoli.)

## CANADA

TRIES TO STABILIZE YELLOW PERCH EX-VESSEL PRICES

The Government's program to stabilize yellow perch prices to Lake Erie fishermen which went into effect August 11 has now been extended to other yellow perch fishing areas of Ontario. The Canadian Fisheries Prices Support Board stands ready to purchase surplus supplies of frozen round or filleted perch from processors at prices sufficient to ensure that Ontario fishermen receive a minimum of 10 cents a pound at point of landing. It is expected that processors will continue to sell maximum quantities into domestic and export channels and rely on sales to the Board only when landings exceed the market's capacity to absorb current production. It may be that market demand will keep the price above the minimum established by the Government. (Canadian Department of Fisheries, Ottawa.)

Note: See Commercial Fisheries Review, Sept. 1966 p. 50.

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LOOK FOR HERRING IN GULF OF ST. LAWRENCE

Canadian plans for an East Coast fish meal industry were encouraged by test fishing in the Gulf of St. Lawrence in the summer of 1966. The explorations were made off Mackerel Point in the Gaspe area by the 80-foot purse-seiner Western Ranger, chartered by the New Brunswick Department of Fisheries under a cost-sharing agreement with the Federal Department of Fisheries. It was brought from British Columbia for the experiment.

In 10 days, the vessel landed 1,600 tons of herring at Caraquet, N. B., for reduction to meal. It is demonstrating the effectiveness of West Coast purse-seine methods to Eastern herring fishermen who have been limited to small-scale operations. The seine net used was 325 fathoms long and 36 fathoms deep. In catches off Mackerel Point, the net depth had to be reduced because herring were found here in 30 fathoms.

In addition to the skeleton crew that sailed it to New Brunswick from Vancouver, B. C., the vessel employs 5 East Coast fishermen. Exploratory work elsewhere in the Gulf will be carried out during the balance of the charter. Canadian Department of Fisheries, Ottawa.

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## MID-JULY SALMON CATCH GOOD IN BRITISH COLUMBIA

As of July 15, 1966, the northern fishing area of British Columbia reported unexpectedly high catches of pink and sockeye salmon in the net fisheries. One million early pink salmon were taken from the run to Seymour Channel and the run was expected to peak in August. During the first two days, 922,000 sockeye were taken in the Skeena River. Troll catches of king and silver salmon were also good. (Canadian Department of Fisheries.)

# LATIN & SOUTH AMERICA

## Cuba

### EXPANDS FISHING FLEET

From 1961 to May 1966, Cuba added over 66 small vessels built in her shipyards to the fishing fleet and purchased 50 larger vessels abroad. Most of the latter came from Spain. Others were bought from Japan, the U.S.S.R., and Poland. Almost all were tuna vessels, except 6 cod trawlers bought from Spain in 1966 and 5 medium trawlers (SRTs) obtained from the U.S.S.R. in 1962. About 22 tuna vessels ordered from Spain are still to be delivered. However, the first cod trawler, the Manjuari, also purchased from Spain, was delivered to Havana in March 1966 and soon after began fishing for cod off the Canadian Atlantic coast. The crew is Cuban, but the captain is Russian. (It docked at St. John's, Newfoundland, on June 27, 1966, for servicing.)

Cuban shipyards employ about 2,500 workers and build 7 classes of wooden fishing vessels 60 to 120 feet long. They are beginning to construct a few steel vessels. By 1970, the Cubans hope to have 700 large vessels (mostly in tuna and possibly cod and other bottom fisheries) and 900 small craft. The planned catch for 1970 exceeds 200,000 metric tons a year. Almost 4,000 young Cubans are now being trained in marine and fishery schools.

## Chile

### PRODUCTION OF FISH MEAL AND OIL RISES

Anchovy fishing in northern Chile during June 1966 was considered good. Landings totaled 99,600 metric tons, compared with 15,900 tons in 1965, and 93,700 tons in 1964. Nineteen percent was landed at Arica and 81 percent at Iquique; fishing in the Pisagua and Tocopilla areas was discontinued. The greatest fishing activity was in the area bordering Peru, where the major part of the Arica and Iquique fleets fished.

The catches of the first 6 months of 1966 totaled 755,500 tons of anchovy, an increase of 181 percent over 1965 and 24 percent over 1964.

During June, 6 plants operated in Arica an average of 11 working days; 21 plants operated in Iquique an average of 16 working days. One plant in Arica, 2 in Pisagua, and 1 in Iquique did not operate.

Monthly production of fish meal during the first halves of 1964-66 was:

| Month | 1966 | 1965 | 1964 |
|---|---|---|---|
| | (Metric Tons) | | |
| January | 33,500 | 12,836 | 24,131 |
| February | 27,182 | 11,370 | 23,575 |
| March | 13,538 | 10,278 | 4,767 |
| April | 114,068 | 3,587 | 16,373 |
| May | 26,708 | 4,090 | 16,233 |
| June | 18,778 | 2,988 | 17,271 |
| Total January-June | 133,774 | 45,149 | 102,350 |

The company with the highest production from January through June 1966 totaled 24,000 tons of fish meal. An individual plant in Arica produced 13,700 tons; others produced 9,500 tons, 8,700 tons, and 8,200 tons, respectively. These 6 plants represent 48 percent of total fish meal production.

The recovery of fish oil in June amounted to 3,200 metric tons. Total production for the first 6 months of 1966 amounted to 14,400 tons, compared with 5,800 tons in 1965 and 12,600 tons in 1964. The yield of recovery in June was 3.2 percent (1965, 1.2 percent; 1964, 3.7 percent; 1963, 3.0 percent). The highest yield of oil during the first half occurred in April (3.3 percent), which coincides with the 1965 results.

Fish meal produced locally between Antofagasta and Talcahuano from other species (hake, sardine, jack mackerel, fish waste, etc.) and which supplies mainly the domestic market, totaled 1,700 tons in June 1966. The total of 15,700 tons during the first half was up 14 percent over 1965 and 97 percent over 1964. Of this year's production, Antofagasta produced 2,800 tons; Coquimbo 400 tons; San Antonio 2,400 tons; and Talcahuano, 9,700 tons.

During the first quarter of 1966, the Customs Bureau reported exports of 51,424 tons of fish meal, valued at US$7,228,000 and 197 tons of shellfish meal worth US$14,100. Exports of fish meal by months were: January 7,304 tons; February 18,958 tons; and March 25,168 tons. The main buyers were the United States, the Netherlands, and Germany.

Exports of oil during the first quarter amounted to 2,486 tons with a value of US$441,300 and was purchased entirely by the Netherlands. (U.S. Embassy, Santiago.)

## Mexico

MAY BUY YUGOSLAV VESSELS

An investment group from Ensenada discussed in mid-summer with a Yugoslav trade mission the purchase of 5 vessels from Yugoslavia. The group is considering entry into the high-seas fisheries. The Federal Government is reportedly prepared to help with an allocation of 75 million pesos (US$6 million).

# WEST INDIES

## Trinidad and Tobago

SHRIMP PROJECT NEARS COMPLETION

The plan to give Trinidad and Tobago a shrimp fishing industry costing TT$1.2 million (US$700,000) was nearing completion, according to reports from Port-of-Spain. Twelve shrimp trawlers are being built. A shrimp-packing plant will be constructed at King's Wharf, Port-of-Apain. (Fishing News International.)

SARGASSO SEA TO BE CHARTED BY SCANDINAVIANS

Sargasso Sea, home of a floating mass of seaweed that for centuries has been a feared legend among seafarers, is about to be investigated by today's scientific Norsemen.

A joint expedition of Swedish and Danish scientists left for the Sea in early 1966 aboard the Danish research vessel Dana. The Danish scientists will be checking a belief that Scandinavian eels hatch their eggs among the tangled strands of weed. The optics of the Sea, which are affected by millions of brown algae, or Sargassum, will be investigated by the Swedish team, under the direction of a scientist of the Oceanographic Institute in Gothenburg, Sweden. (Reprinted, with permission from Science News, weekly summary of current science, copyright 1966 by Science Service, Inc.)

# Foreign Fishing Off United States Coasts, August 1966

## IN NORTHWEST ATLANTIC

U.S.S.R.: The July fog and haze off Georges Bank and in vicinity continued into August, again restricting visibility and the observations of Soviet fishing. The estimated size of the fleet declined from an estimated 125 in early August to about 50 by month's end.

The decrease in Soviet fleet on Georges Bank occurred rather early this year. In 1964, it had decreased abruptly (by about 50-60 vessels) only in October--when most vessels transferred operations to southeastern Atlantic off Africa's coasts. The pattern was repeated in 1965. In 1966, however, to save fishing time, the Russians decided not to transfer their northwest Atlantic trawler fleet to the southeastern Atlantic. Some vessels moved from Georges Bank to ICNAF Subarea 4, others southward to the newly opened Havana fishing port, and others returned to home ports or to other fishing areas.

Eighty-eight different vessels were sighted during August: 25 factory stern trawlers, 22 medium side trawlers, 9 medium refrigerated side trawlers, 19 large refrigerated side trawlers, 3 processing refrigerated fish transports (Skryplev class), 1 refrigerated transport, 5 cargo and base ships, 1 tug, 2 tankers, and 1 research vessel.

The fleet operated in two general areas--40 miles south of Nantucket Island and in the Corsair Canyon area, 160 to 180 miles east of Cape Cod.

Catches were frequently scattered, indicating fishing was generally poor. Whiting (silver hake) appeared to be the predominant species taken. Twice during the month, Soviet vessels in the Corsair Canyon area were observed with moderate to substantial amounts of haddock on deck. Due to poor visibility, the area could not be covered during the month's last flight.

Polish and Romanian: Two Polish stern trawlers and one Romanian stern trawler were observed fishing with the Soviet fleet on Georges Bank. None of those vessels was seen with fish on deck.

East German: A large (3,000-gross-ton) factory stern trawler (ROS 302) was fishing near Georges Bank toward the end of August, the first time since 1962 that the East Germans extended operations to southernmost ICNAF subarea. Traditionally, they fish off Greenland and Labrador, in the North Sea and Baltic. This year, however, they also began to fish for pilchards off South-West Africa and to explore the South Atlantic.

## OFF MID-ATLANTIC

U.S.S.R.: No Soviet fishing vessels sighted off the U.S. mid-Atlantic coast during August, except a few in transit headed north or south.

## IN GULF OF MEXICO AND CARIBBEAN

U.S.S.R.: Medium freezer side trawlers (class Maiak) continued to fish in Gulf of Mexico, but not off U.S. coasts. They limited activity mainly to Campeche Banks off Yucatan Peninsula. Number of vessels fluctuated between 10 and 15. Although all are based at the Havana fishing port, they belong administratively to Kaliningrad Fisheries Administration. Early in 1966, that Administration formed a special Command, the Expeditionary Fleet Command, whose task is to start large-scale operations in the southwestern Atlantic. The Maiak-class, Havana-based Kaliningrad vessels will eventually be deployed to the South Atlantic.

In addition to medium side trawlers, about 12 large stern trawlers also fished on Campeche Banks. Some were deployed to the Gulf from the Northwest Atlantic; others arrived from Soviet ports. They belong also to the Kaliningrad Expeditionary Fleet Command, and some of them are reportedly fishing in the Gulf of Mexico only temporarily. Later they will be sent to the Southwest Atlantic.

Some of those vessels were sighted off Florida's coast on their way south. Others, no doubt, were returning to home ports from Cuban base. None was seen fishing.

Cuban: No vessels were sighted fishing off U.S. coasts. Some were reported fishing off southwest coast of Puerto Rico.

Mexican: In late July and early August, Mexican shrimp trawlers were sighted fishing off Texas.

OFF PACIFIC NORTHWEST
(Washington and Oregon)

U.S.S.R.: The fleet, which numbered 100-110 fishing and support vessels during June, July, and first two weeks in August, had only about 80 vessels by end of August-early September (table).

Number of Soviet Trawlers and Support Vessels Sighted Off Pacific Northwest, July-Mid-September 1966

| Week ending: | ST | MT | Other | Total |
|---|---|---|---|---|
| July 2 . . . . . | 8 | 76 | 21 | 105 |
| July 9 . . . . . | 7 | 80 | 23 | 110 |
| July 16 . . . . | 9 | 78 | 24 | 111 |
| July 23 . . . . | 9 | 64 | 21 | 104 |
| July 30 . . . . | 11 | 76 | 18 | 105 |
| Aug. 6 . . . . | 13 | 72 | 23 | 108 |
| Aug. 13. . . . | 10 | 77 | 19 | 106 |
| Aug. 20. . . . | 4 | 58 | 20 | 82 |
| Aug. 27. . . . | 2 | 56 | 19 | 77 |
| Sept. 3 . . . . | 3 | 58 | 23 | 84 |
| Sept. 10 . . . | 6 | 56 | 19 | 81 |
| Sept. 15 . . . | 5 | 58 | 20 | 83 |

Note: "ST" - Large factory stern trawlers (2,600-3,200 gross tons).
"MT" - Medium trawlers (250-600 gross tons).
"Other" - Floating factories refrigerated carriers, transports, tugs, tankers, research vessels, and other support vessels.

From August 6 to September 15, number of large stern freezer trawlers was reduced from 13 to 5, and medium side trawlers from 72 to 58. This was significant decrease in Soviet fishing effort off Pacific Northwest; it was probably caused by the beginning of herring fishing in the Sea of Okhotsk and off Kamchatka's coasts, and saury fishing off Kuril Islands and Hokkaido.

Number of support vessels remained almost the same, indicating smaller fleet was making good catches.

The vessels fished in heavy concentrations, moving up and down the coast as fish were available.

Early in August, the fleet was fishing off Destruction Island. Then part of it moved south to Grays Harbor and Willapa Bay, and part north to Cape Flattery off northern Washington. At least 6 medium trawlers were fishing in pairs using 3 midwater trawls. Several vessels (at least 3 stern trawlers and 2 medium trawlers) were reported fishing about 20 miles off Cape Beale, off southwestern Vancouver Island, British Columbia.

By mid-August the fleet, still scattered from mouth of the Columbia River to Straits of Juan de Fuca, moved seaward; some vessels fished as far as 50 miles from U. S. shores.

By August 25, the fleet was again reported near the U. S. coasts, divided into two groups: one with 50 vessels was fishing for hake and orange rockfish off Newport, Oregon, concentrated in a 10-mile radius. The second with 32 vessels was fishing for hake off Willapa Harbor, Washington.

By the end of August, only about 30 vessels remained off Oregon's coast, the rest moved north off Willapa Harbor. The catches off Oregon were excellent and somewhat better than off Washington coast.

In the first week of August, Pacific hake catches appeared about average: the greatest was around 30,000 pounds; the smallest about 2,000 pounds.

In the second and third weeks, hake was still principal catch; however, the vessels off Destruction Island and to the north were reported catching more Pacific ocean perch and other rockfish than hake. Several vessels were seen with good catches of red snapper on deck.

By the end of August, when the fleet split into two groups (one off Oregon, the other off Washington), hake was again the principal species caught. Medium trawlers fishing off Oregon were seen taking as much as 25,000 pounds, and a "twin" trawl was observed with estimated catch of 150,000 pounds of hake. Some green-spotted or green-striped rockfish were also taken.

The estimated 1966 Soviet catch of Pacific hake off U. S. coasts amounted to over 60,000 metric tons (about 132 million pounds) by mid-August. The Soviet quota for 1966 is 100,000 metric tons.

The research vessel Adler tried to enter port of Vancouver, British Columbia (Canada) for repairs at end of July, but Canadian officials determined the repairs were not of emergency nature. Earlier, the Canadians did allow the Adler to resupply at Vancouver. By August 2, the vessel was again conducting research off Cape Elisabeth (Washington), then moved south to study fishery resources off California and northern Mexico. By mid-month, she returned north for short time before returning to Vladivostok; she arrived September 10. Her principal mission was investigation of fishery resources off U. S. and Mexican coasts for future exploitation.

The research vessel Ogon, which belongs to Pacific Scientific Institute for Fisheries Oceanography (TINRO), was sighted in August off Grays Harbor, and remained off Pacific Northwest well into mid-September. During August, Resource Management Agents of BCF did not see salmon on decks of fleet vessels nor did they see salmon hanging in the rigging. This does not exclude possibility that the Russians were making incidental catches of salmon, because surveillance flights took place only one day a week and each vessel could be observed only for short time. However, a few U.S. fishermen did report seeing fishing vessels with salmon on deck. On August 20, Oregon Fish Commission officers, checking a fisherman's report, spotted a medium trawler with salmon on deck. Identified as the Kakhovka, she was sighted about 10 miles west and 5 miles north off mouth of Columbia River with load of salmon on deck.

BCF's Region I has formed an ad hoc committee of 25-30 representatives of Pacific Northwest fishing industry (fishermen's associations, unions, and fishing vessel owners' associations), fishery officials from State governments, and other citizens. The purpose of the committee, which will meet informally about once a month, is to disseminate information on foreign fishing off U. S. Pacific Northwest coasts and appraise all developments related to future foreign fishing near U. S. shores.

During routine surveillance flights by U. S. Coast Guard in August, practically no Soviet vessels were sighted closer than 12 miles off U. S. Pacific Northwest coasts. But, on August 23, the BCF research vessel John N. sighted 6 Soviet medium trawlers northwest of Columbia River's mouth close to U. S. waters. On August 24, ten medium trawlers fished the same general area, 8.7-10 miles off U. S. coast.

During a chartered flight by Oregon Fish Commission agents on August 20, 20-25 vessels were seen near Columbia River's mouth, the closest vessel 7.8 miles off U. S. coast.

## ALASKA

U.S.S.R.: During August, about 40 fishing and support vessels operated off Alaska's coast.

Fishing for Pacific ocean perch was conducted throughout the Gulf of Alaska and off Aleutian Islands. The Gulf perch fleet was small: 4 large stern trawlers, 1 medium side trawler, and 2 refrigerated fish carriers; the Aleutian fleet had more than 20 vessels: among them, 10 large stern trawlers, 8 medium side trawlers, and 3 refrigerated carriers. Little information is available on perch fishing south of Pribilof Islands--only one medium side trawler was sighted, presumably exploring for ocean perch stocks.

According to Soviet sources, perch fishing in Gulf of Alaska was less satisfactory in August than in July. Bad weather was one reason, but principal reason was lack of exploratory and scouting vessels and assignment to fleet of young, inexperienced fishermen.

The shrimp fishing fleet, which had returned to U.S.S.R. in mid-1966, was again sighted in Shumagin Islands area in August. Three medium side freezer trawlers were sighted during surveillance patrol by BCF management agents aboard U. S. Coast Guard cutter. No estimates of catches are available.

Whaling operations in northern Pacific continued on large scale but only one large factoryship was sighted in western Aleutians about mid-August.

Japanese: A total of 206 Japanese vessels were fishing off Alaska coast in August.

Pacific ocean perch fishing in Gulf of Alaska was in full swing in early August, when 5 trawlers ended salmon buying in Cook Inlet, and 2 trawlers ended shrimp operations in Shumagin Islands area and resumed perch fishing. One vessel was added to Gulf fleet in late August. At month's end, 12 trawlers and 3 reefers were on Albatross Bank and one trawler was fishing on outer Portlock Bank.

In Aleutian Islands area, along the central and western Aleutians, two factoryships and 11 trawlers fished for perch.

The two king crab fleets remained on Bristol Bay "flats" throughout August, about 150 miles northwest of Port Moller.

Fish meal and oil operations were conducted by 2 factoryships accompanied by 58 trawlers about 200 miles south of Nunivak Island, and by 2 factoryships accompanied by 40 trawlers northwest of Pribilof Islands.

One factoryship and her 13 trawlers remained on shrimp grounds near Pribilof Islands throughout August.

The three whaling fleets operated throughout Aleutian Islands. One fleet departed for Japan at month's end.

Long-line operations for sablefish were conducted in late August by 1 vessel in western Gulf, 2 vessels along western Aleutians, and 1 vessel along 100-fathom curve north of Unimak Pass.

Korean: The research vessel Baek Kyun Ho of the National Pusan Fisheries College was sighted south of Amukta Pass in central Aleutians on August 13. A BCF agent boarded vessel. Personnel reported being in Aleutians area for about one month and planned sail for Korea on September 20. The vessel fished for salmon using gill nets at preselected stations. Samples of 50 salmon per day were to be taken at each station, but catches were said to be poor--averaging 15 a day, mostly small red salmon. The Koreans said they had trawled but had taken no salmon. On August 25, the vessel was in northern Bering Sea, north of St. Matthew Island.

## JUNK CARS MAKE EFFECTIVE ARTIFICIAL FISHING REEFS

Abandoned cars and other refuse that clutter up our cities and countryside have proven to be good material for building fishing reefs in the sea, according to a report published by the American Littoral Society.

The fish are attracted to the artificial reefs because some feed off mussels and other organisms which attach themselves to the reef materials. Other fish find protection in the holes and crevices, and still others simply like a place to call "home". A properly constructed reef in time becomes a veritable "city of fish"--a collection point for year round food fish as well as a seasonal haunt of migratory game fish.

The growing acres of junk cars now plaguing cities may prove a blessing in disguise to fishermen. Fishery biologists have proved with test reefs that a barren part of the sea can be transformed into a favored haunt for fish. Between 1958 and 1960, a small car-body reef was built at a depth of 50 feet in Paradise Cove near Malibu (California). Fish were attracted only a few hours after it was down. Over a 30-month study period, 49 different species of fish were counted on the reef by SCUBA diving biologists. One of the best experimental reefs was built in Maunalua Bay, Hawaii, and tested from 1961 to 1963. Junk cars were spread over a virtually barren bottom. Fish life boomed and within 7 months 10 tons of fish came to live on the 13-acre reef made from 443 cars.

The artificial reef tests results showed that the cars stayed in place at the bottom and were not scattered by storms or currents. Junk car reefs, however, would have to be replenished every few years since bodies rust away in 3 to 5 years. Biologists have also tested some more permanent materials (quarry rock and concrete structures) for reef building. However, these are more costly than junk car reefs and do not help in cleaning up our countrysides.

All reefs must have the approval of the District Army Corps of Engineers, the Navy, and in most states, the Department of Conservation. Artificial reefs must also be properly buoyed so that they can be located easily and the buoys maintained. Bottom type, wave action, depth, height and placement of the man-made reef affect the endurance and productivity of the project. Reef-building obviously is not a task for the amateur.

The report, "Artificial Reefs - A Review", is available from the American Littoral Society, Sandy Hook Marine Laboratory, Highlands, New Jersey 07732, for $1.00 a copy.