

Japanese fishing vessels and crewmen seized by Soviets, 1946-1969.

(See p, 68: "Soviets Seize Japanese Vessels")

# INTERNATIONAL

## WORLD FISHING IN 1968 SET RECORD

In 1968, the world's fishermen caught a record 64 million metric tons; the 1967 figure was 60,700,000 tons. The Food and Agriculture Organization reported these data on Dec. 7, 1969.

The 1968 total included 7,400,000 tons of fish from rivers, lakes, ponds, and other inland waters, an increase of 100,000 tons.

The marine catch--fish, crustaceans, molluscs, and other marine animals--was 56,600,000 tons. The 1967 total was 53,400,000 tons.

The estimates, based on official data, are reported in the new 'Yearbook of Fishery Statistics, Catches and Landings, 1968,' Volume 24, published by FAO's Department of Fisheries.

### Peru No. 1

Peru was No. 1 again with a record 10,520,300 tons; her catch was 10,133,700 tons in 1967. Almost all of it was anchoveta--converted into fishmeal for export.

Japan was second with 8,669,800 tons (7,850,400 tons in 1967). The USSR, No. 3, reported 6,082,100 tons--the first time she exceeded 6 million tons. (The 1967 Soviet catch was about 5,777,100 tons.) Mainland China was fourth with 5,800,000 tons. The figure was based on a 1960 estimate because no recent figures were available.

Norway was fifth with 2,800,100 tons, a drop from the 3,268,700 tons of 1967. The United States followed with 2,442,000 tons. This was only slightly over the 2,430,500 tons of 1967.

Then followed the Republic of South Africa with over 2,000,000 tons; Denmark and the Faroe Islands, 1,633,100 tons; India, 1,526,000 tons; Spain, 1,503,100 tons; Canada, 1,490,300 tons; Chile, 1,376,100 tons; Indonesia, 1,175,800 tons; Thailand, 1,088,000 tons; and the United Kingdom, 1,040,300 tons.

Iceland dropped to 600,700 tons in 1968. She had caught 1,240,000 tons in 1966 and almost 900,000 tons in 1967. Between 500,000

and 1,000,000 tons were: Republic of China, France, Federal Republic of Germany, Portugal, Republic of Korea, and North Korea.

About 26 other countries reported 1968 catches between 100,000 and 500,000 tons. The remainder caught fewer than 100,000 tons.

### Catches by Continents

All continents showed significant catch increases except Europe, excluding the USSR.

Asia led with 24,250,000 tons, up from 22,590,000 in 1967. South America was second with 12,880,000 tons (12,130,000 tons in 1967). Europe was third with 11,800,000 tons (11,900,000 tons in 1967). North America had 4,570,000 tons (4,430,000 tons in 1967); Africa 4,220,000 tons (3,730,000 tons), and Oceania, 210,000 tons (200,000 tons).

### Catches by Species

Almost a third of the 1968 catch were Peruvian anchoveta, sardinellas, pilchards, North Pacific herring, and oil sardines. These totaled 20,500,000 tons, an increase of 900,000 tons above 1967.

Catches of the mackerel species reached a record 2,300,000 tons, compared with 2,000,000 tons in 1967. Cods, hakes, and haddocks were a record 9,500,000 tons, an increase of almost 1,300,000 tons. Increases were recorded in Alaska pollock, Atlantic cod, and Cape hakes; but Patagonian hake dropped from 600,000 tons in 1967 to fewer than 200,000 tons in 1968.

Flatfish, such as flounders, halibut, soles, and tonguefishes, totaled 1,200,000 tons. Redfishes, basses, congers, croakers, drums, sand eels, and porgies remained stable at 3,200,000 tons. Stable, too, were catches of amberjacks, horse and jack mackerels, and scads; for the past 6 years these have stayed at 2,000,000.

The catch of albacore, bigeye, bluefin, bonito, skipjack, and yellowfin tuna remained about 1,400,000 tons.

Sharks and rays appeared to be leveling off between 400,000 and 500,000 tons.

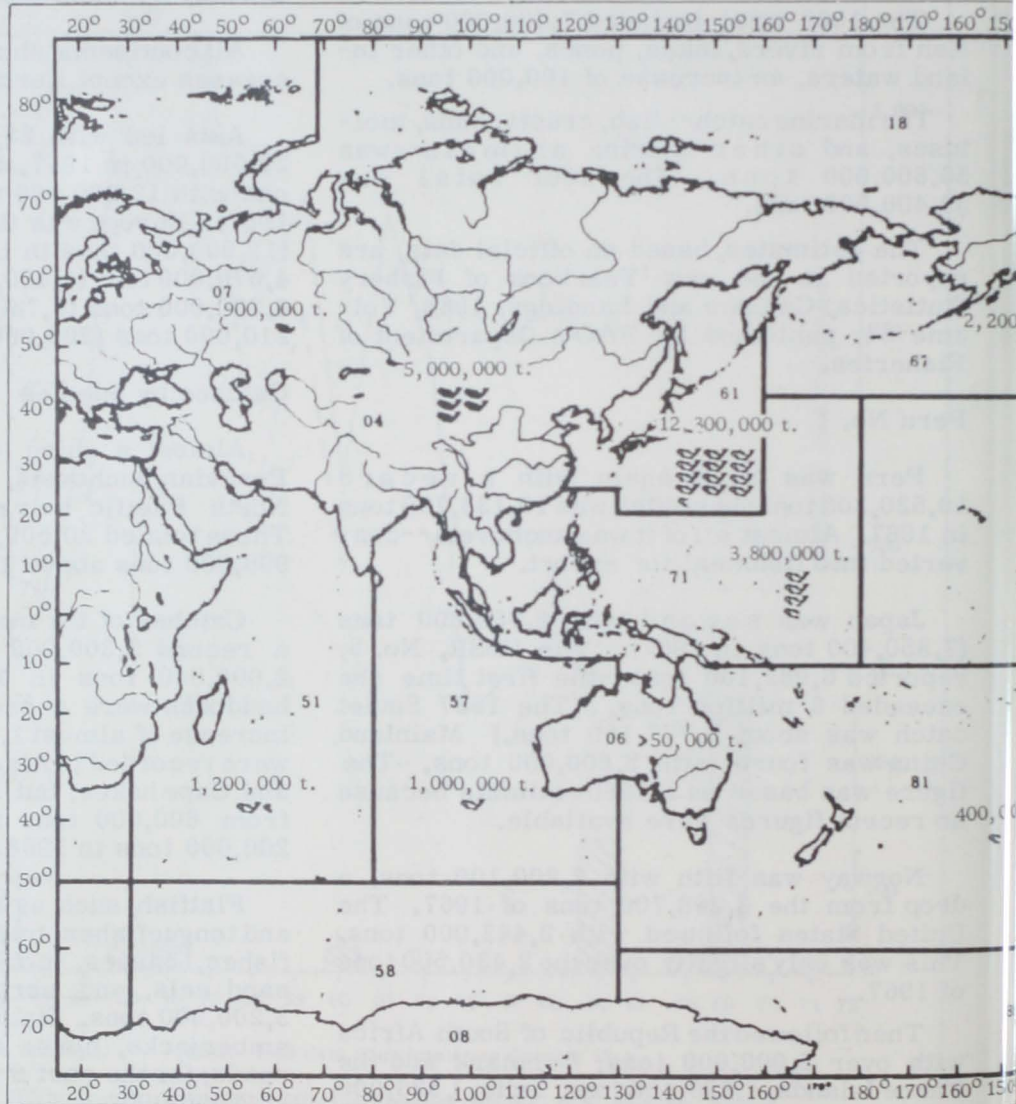
1968 WORLD CATCH BY

INLAND WATERS

- 01 Africa
- 02 America, North
- 03 America, South
- 04 Asia
- 05 Europe
- 06 Oceania
- 07 USSR
- 08 (Antarctic)

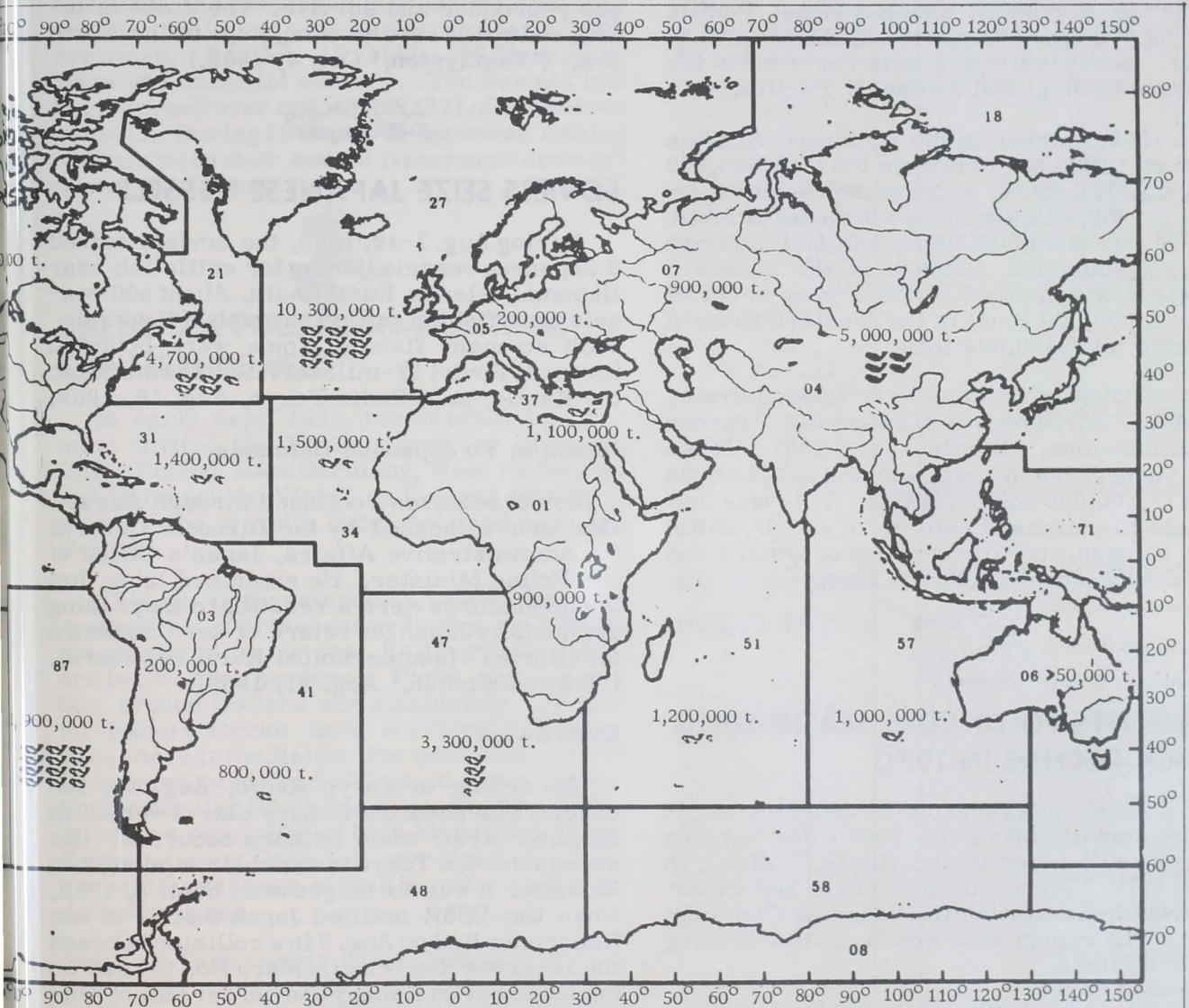
MARINE AREAS

- 18 Arctic
- 21 Northwest Atlantic
- 27 Northeast Atlantic
- 31 Western Central Atlantic
- 34 Eastern Central Atlantic
- 37 Mediterranean and Black Sea
- 41 Southwest Atlantic
- 47 Southeast Atlantic
- 48 Antarctic Atlantic
- 51 Western Indian Ocean
- 57 Eastern Indian Ocean
- 58 Antarctic Indian Ocean
- 61 Northwest Pacific
- 67 Northeast Pacific
- 71 Western Central Pacific
- 77 Eastern Central Pacific
- 81 Southwest Pacific
- 87 Southeast Pacific
- 88 Antarctic Pacific



Certain boundaries of the major fishing areas are provisional, particularly those in the Indian and Pacific Oceans.

# MAJOR FISHING AREAS (FAO)



☞ = 1,000,000 m.t. = ☞

## Catches by Sea Areas

The FAO Yearbook also showed the distribution of catches by areas. The Northwest Atlantic yielded a record 4,700,000 tons, compared with 1967's 4,000,000 tons. Catches increased also in the Eastern Central Atlantic (up to 1,500,000 tons from the 1,000,000 of 1965); in the Southeast Atlantic (up to 3,300,000 tons from 2,600,000 tons in 1967); and in the Northwest and Northeast Pacific (14,500,000 tons compared with 13,800,000 in 1967). Steady increases were recorded in the Western Central and Southeast Pacific.

In 1968, catches in the Southwest Atlantic dropped to 800,000 tons from 1967's 1,300,000 tons mainly because of decreased Soviet fishing. In 1968, catches in the Northeast Atlantic leveled off at 10,300,000; in the Indian Ocean at 2,200,000 tons. Catches in the Mediterranean Sea remained at the 5-year level of about 1,000,000 tons; in the Western Central Atlantic, at 1,400,000 tons.

The catch of crustaceans--marine crabs, lobsters, shrimps and prawns--hit a record 1,400,000 tons, slightly above 1967. There was an increase in mollusc catch to 3,400,000 tons (3,100,000 tons in 1967). This was due mainly to increased catches of squids, cuttle fish, octopus, and to production of oysters and mussels at about 1,000,000 tons.



## SCIENTISTS TO DISCUSS SEA HERRING STOCK DECLINE IN 1970

Scientists and government officials, seriously worried about the North Sea herring stocks, will meet in the Hague, Holland, in June 1970. They will prepare a report for the North-East Atlantic Fisheries Commission. The report will outline the herring stock's future.

### Maximum Sustainable Catch

An international plan adopted years ago said the North Sea herring stock could withstand an annual catch of up to 800,000 metric tons. Later, this limit was exceeded and a sharp decrease in the herring fishery resulted. It was impossible for fishermen to find the fish. The herring reappeared slowly.

## Larger Vessels & Better Gear

Larger vessels and more effective gear, such as purse-seine nets, caught younger and younger year-classes. It became possible to maintain a fishery of about 800,000 tons.

However, a significant decrease in herring stock in recent years makes observers feel that the stock has become so weak it no longer can reproduce and survive. The doubt is increased by the results of taggings in the North Sea. ('Vestkysten,' Oct. 4, 1969.)



## SOVIETS SEIZE JAPANESE VESSELS

During Aug. 7-12, 1969, the Soviets seized 8 Japanese vessels fishing for cuttlefish near Habomai Islands, Kuril Chain. About 500 vessels were fishing cuttlefish north of Hokkaido. With so many fishing, some were bound to trespass Soviet 12-mile territorial waters off the Kurils, said Radio Tokyo, Aug. 16, 1969.

### Reaction To Japanese Demands

Soviet seizures continued through August. One was witnessed by the Director General for Administrative Affairs, Japan's Office of the Prime Minister. He explained later that Soviet seizures were a reaction to increasing demands by Japan for return of her "northern territories" (southernmost Kuril Islands). ('Tokyo Shimbun,' Aug. 21, 1969.)

### Eyewitness

According to Tokyo Radio, Aug. 21, the official was aboard a fishery patrol vessel in Nemuro Strait when seizure occurred. His account moved Tokyo to consider a protest to Moscow. It was not lodged until Sept. 2, 1969, when the USSR notified Japan that 11 of her fishermen died on Aug. 9 in a collision between the 16-gross-ton 'Fukuju Maru No. 13' and an unnamed Soviet fishery and border patrol vessel. The lone Japanese survivor stated that the Soviet vessel rammed his vessel without warning.

### Japanese Protest

The Japanese protested that the USSR had failed to report incident for 20 days despite a clause in Soviet-Japanese Consular Treaty.

The treaty states that in case of marine accidents both countries are "mutually obligated to inform each other immediately." ('Washington Post,' Sept. 12, 1969.)

### Startling Record of Seizures

The situation is serious. Startling figures obtained recently by Regional Fisheries Attache, U.S. Embassy, Tokyo, from Japan's Maritime Safety Agency, show: Between 1946 and 1969, the Soviets seized over 1,300 Japanese vessels and arrested more than 11,000 crewmen. By Oct. 15, 1969, 135 fishermen were still in Soviet custody. The Soviets had not returned over one-third (482) of the seized vessels. During 1946-69, 21 Japanese fishing vessels were sunk and 32 fishermen drowned during Soviet seizures.



## BALTIC SEA POLLUTION-CONTROL CONFERENCE HELD

In early Sept. 1969, the Swedish Government invited the Baltic countries (Finland, USSR, Poland, East Germany, West Germany, and Denmark) to Visby, on Gotland Island, to discuss the world's most polluted sea: the Baltic.

This sea is threatened by increasing concentrations of poisonous hydrogen sulfides in stagnant shallow waters. Its deep waters also are becoming a problem. Parts of the Baltic Sea around Gotland are completely lifeless: no fishery stocks have survived pollution. Elsewhere in the Baltic, the pesticide content in marine birds and fish is 10 times higher than in similar North Sea animals. The problems are compounded by a high-lying ocean floor between Denmark and Norway. This prevents exchange of Baltic waters with the Atlantic Ocean.

### Political Differences Block Action

The meeting's main purpose--adoption of joint measures to fight coastal pollution--was not realized because of political differences. The East European countries wanted a high-level, ministerial follow-up (implying diplomatic recognition of East Germany), while the Western countries favored a simple "administrative approach." So the conference results were inconclusive.

"Nothing practical ensued," reported the research director of Sweden's Board of Nature Conservation ('New York Times,' Oct. 26, 1969).

### Soviet Comments

Soviet sources confirm the 'Times' story. The 'Komunist Armenii,' on Sept. 28, said the Baltic's oxygen content is 2.5 times "below the normal content," even in "open waters." A Tass correspondent interviewed the head Soviet delegate, Ivan Borodavchenko, Deputy Minister for Reclamation and Water Conservation. He complained that "political problems" and the "unrealistic policy of Western countries" prevent strong measures to solve the problem. He said it is necessary to "sign an international treaty" to prevent Baltic pollution. East Germany must sign as a sovereign and "independent state." It is not possible to solve the problem on a "bureaucratic level when only heads of various departments participate."

At the end of the conference, a protocol was signed expressing the Baltic states' "interest in keeping the Baltic clean." ('Sov. Latviia,' Sept. 18, 1969.)



## NEW ATLANTIC TUNA BODY MEETS IN ROME

The great mobility of tunas and of fishing fleets necessitates prompt action to conserve heavily fished tuna stocks in the Atlantic Ocean. Roy I. Jackson, FAO's Assistant Director-General of Fisheries, said in Rome on Dec. 1, 1969. He spoke at the first meeting, Dec. 1-6, of the new International Commission for the Conservation of Atlantic Tunas called to work out its future program. The commission was established under a 1966 convention. It went into force in 1969.

### 8-Year Delay

Jackson said that almost 8 years had passed since it became apparent that international action was needed to conserve Atlantic tuna stocks. In that time, tuna fishing there had increased from 292,000 metric tons in 1961 to 382,000 tons in 1968 and was still increasing.

The commission was formed because experts of several nations recognized that certain stocks were being heavily fished and that there would be increasing pressure in the future. It was formed "with the hope that the problems which the tuna fisheries of the Atlantic are presently facing and which endanger its future may be solved."

#### Tuna & Vessel Mobility

Jackson noted the great mobility of some tuna stocks, which migrate from ocean to ocean. He said that "tuna fishing vessels themselves are becoming more and more mobile and can move rapidly to more profitable fishing grounds."

He added: "This mobility of the fish themselves as well as the fishing fleets necessitate close cooperation between international and national bodies in order that effective conservation methods may be devised."

He urged attention also to the problem of overconcentration of fishing on particular stocks. He suggested that the commission give high priority to assessment studies. And he hoped for close cooperation between the commission and FAO, which helped to draft the tuna convention. It was signed in Rio de Janeiro, Brazil, in May 1966.

#### Rome Conference

At its Rome session, the commission considered proposals to study tuna and tuna-like populations, statistics and research, enforcement of recommendations, relationships with other international organizations, and a permanent site.



## JAPAN-USSR DISCUSS DECLINE OF PACIFIC SAURY STOCKS

The 2nd Japan-USSR scientific meeting on northwest Pacific saury resource was held in Tokyo, Nov. 4-8, 1969. Their scientists agreed that saury resource has declined. They attributed this primarily to poor reproduction during past few years. However, as during 1968 meeting, they disagreed on population and age structures of saury.

#### Disagreement

The Japanese believe the northwest Pacific saury population consists of 2 groups: one spawns in spring, the other in fall. The large fish are 2-year-olds spawned in fall; medium are 1.5-year-olds spawned in spring; small fish are 1-year-olds spawned in fall.

The Soviets pointed out there was only one group, which spawns in the winter. They estimated large fish to be 3.5 years old, medium 2.5 years old, and small 1.5 years old.

#### Soviet & Japanese Interpretations

The Soviets explained that the resource's decline is due largely to overfishing. They cautioned that taking large fish would prevent adequate spawning. They noted that mackerel and saury compete for food, and that mackerel eat saury larvae and contribute to decline.

The Japanese blamed decline more on natural loss, and advised against taking small fish.

The 3rd meeting will be held in the Soviet Union. ('Shin Suisan Shimbun Sokuho,' Nov. 11, 1969.)



## EUROPE

### USSR

#### ARTIFICIAL SATELLITES USED FOR MARINE RESEARCH

The Soviets have been using artificial satellites for oceanographic and marine-resources studies, according to TASS. The press agency announced on Oct. 12, 1969, that experiments during the flights of Soyuz 6, 7, and 8 showed "it would be possible to change the climate of the planet and to use correctly its resources."

#### Space-Flight Data

In the next 2 days, more information became available, including photographs of "characteristic sections of the Earth surface...cyclones and cloud formations." The Soyuz-7 crew photographed the Caspian Sea--the test area for aerospace-oceanography experiments.

Ground tracking stations in Soviet territory and 7 research vessels of the Academy of Sciences continuously received and processed information from the spaceships and kept in contact with their crews.

In the first 42 hours in orbit, Soyuz 6 and 7 made successful "observations of...our country carried out simultaneously from Soyuz-6, from an aircraft, and from ground stations."

#### Program Objectives

Aleksei Konstantinov, space scientist of the Soviet Academy of Sciences, said the objective was to "determine correction coefficients necessary to move from experiments carried out with aircraft to experiments in orbit with an artificial satellite."

When analyzed, data would be used in "elaborating geological and geographical maps, both for our own country and for our planet in general." The data also would be used "...in other fields of the national economy, such as in the study of the wealth of the world's oceans."

\* \* \*

#### NEW WASTE-WATER FILTER IS DESIGNED

A new waste-water filter for medium trawlers prevents pollution by oil products. The filter is a sand box that retains oil impurities by combining with them. It can process 300-400 kilos of water per hour.

The filter is 90x72x47 cm. and weighs 50 kilos. It will be introduced into all vessels of the Soviet Western Fisheries Administration's Tallin Trawler Fleet Base. ('Rybnoe Khoziaistvo,' No. 9, 1969.)

#### 1954 International Convention

The new filter meets the requirement of the 1954 international convention to prevent oil pollution of sea water. The convention prohibits dumping waste water containing more than 100 milligrams of oil per liter.

#### Inadequate Production

The Soviet industry does not produce enough conventional waste-water filters; also, these cannot be used aboard medium trawlers because they are too bulky and heavy.



### SPAIN

#### FISHING FLEET GROWS

Larger Spanish trawlers and freezers with increased fishing capabilities continue to enter the fisheries. Since 1964, the government has authorized official credits and tax rebates to construct vessels; special loans are available for large vessels. The objective is to promote development of a modern fleet of about 600,000 gross registered tons (GRT) by the end of 1970. This is considered sufficient for an average annual catch of about 1,500,000 metric tons of fish.

#### Distant-Water Fleet

The fleet's long-range sectors, trawling cod in the Northwest Atlantic and fishing hake in the South Atlantic, have made sizable gains (Table 1).

Spain began producing frozen fish relatively late but, since 1960, this part of fleet has



## SPAIN (Contd.):

Table 1 - Spain: Fishing Fleet, 1965-68  
(000 Gross Registered Tons)

Tonnage Group	1965	1966	1967	1968	Objective 1970
Over 250 GRT	135.9	155.3	193.6	216.5	250
20-250 GRT	307.0	313.5	328.3	339.7	350
Total	442.9	468.8	521.9	556.2	600

developed rapidly. At the end of 1967, 103 modern freezer trawlers of 82,803 GRT were operating. Of these, 55 were put into service between 1963 and 1966, and about 48 vessels in 1967 and 1968. Many others are under construction and will enter the fisheries in 1969 and 1970; many replace smaller, old vessels.

## Codfish Fleet

The codfish fleet in 1968 also had increased: to 26 trawlers and 126 pair trawlers totaling 58,955 GRT. These operated exclusively on the fishing grounds of Northwest Atlantic (Greenland, Labrador, Newfoundland, and Nova Scotia). Their catches were 95% cod.

## Freezer Trawlers

In 1968, catches by freezer trawlers were 240,000 metric tons, almost 5 times 1964 catch (Table 2). Catches frequently were greater than home demand, so shipowners restricted output and limited catches. In 1969, shipowners turned increasingly toward greater export markets for some products. This fleet operated mainly in Southeast Atlantic off Africa. Catches included 80% hake.

Table 2 - Spain: Estimated Catch by Fleet, 1964-68  
(In 000 Metric Tons)

Type of Fleet	1964	1965	1966	1967	1968
Long-range fleet:					
Freezer vessels	53	133	195	230	240
Codfish vessels	231	234	239	290	340
Medium & coastal	746	744	690	690	680
Other	170	229	221	229	240
Total	1,200	1,340	1,345	1,439	1,500

## Cod Catch

Cod trawlers caught 340,000 tons, up 109,000 tons, about 50%, above 1964. This fleet operated in Northwest Atlantic, where catches were 95% cod.

## Government Plans

The fleet appears to be nearing its objective and may exceed goal set by initial plan. The government plans to restrict increase of

freezer fleet, grant no official aid to construct conventional cod vessels used only for salting cod, develop deep-water tuna fleet, concentrate on modernizing small coastal fleet, and improve marketing. (Reg. Fish. Attaché, Europe, Nov. 25, 1969.)



## SWEDEN

FISHING INDUSTRY FUTURE  
IS NOT PROMISING

For the fourth successive year, Sweden's fishing industry faces great difficulties. Until 1965, profits trended upward. Since then, catches and income have gradually decreased, affecting owners of larger boats in particular.

In 1968, Swedish fishermen landed 307,172 metric tons of fish worth 218.1 million kronor, <sup>1</sup>/<sub>1</sub> the lowest quantity since 1962 and lowest value since 1963.

While other workers have received more pay each year, the estimated fishermen's income in 1969 will be only a little more than half of what they earned in 1965. The industry's prospects are not promising.

## Recent Developments

In 1962, Swedish fishermen caught two-thirds of domestic consumption; now imported fish are the larger part. Since 1965, import of fish and fish products have more than doubled. In 1968, these totaled 72,900 metric tons worth 279 million kronor.

Norway, Denmark, and Iceland, the main suppliers, account for 73% or 204 million kronor, of total imports. Imports from Canada, tripled since 1967, reached 21 million kronor. This expansion was attributed to a large increase in shrimp imports. However, 90% of this reportedly is U.S. shrimp exported from Canadian ports. Direct imports from U.S. declined 5 million kronor to 9.2 million kronor. This was because less canned crab meat was imported, whereas its import from Japan and Soviet Union rose 5 and 3 million kronor, to 8.4 and 15.2 million kronor.

## Foreign Trade

In 1968, total foreign trade in fish and fish products resulted in import surplus of 154 <sup>1</sup>/<sub>1</sub>Sk. 5.17 equal US\$1.

## SWEDEN (Contd.):

million kronor. Export quantities dropped 7% from 1967 and totaled 187,600 metric tons, although value stayed at 124.5 million kronor.

Exports to Denmark were 75% of total value and 93% of quantity. To a large extent, these were direct landings by Swedish fishermen in Danish ports.

Swedish fishermen prefer to land larger part of herring catches in Danish ports for 2 reasons: shorter distances from fishing grounds, and Denmark has efficient processing industry and is convenient for shipments to West Germany.

In 1968, imports of frozen fish fillets were 44% of Swedish fish consumption by weight. They increased during 10-year period from 4,000 metric tons to 14,000 metric tons worth almost 50 million kronor. The European Free Trade Association (EFTA) agreement has removed the import protection Swedish fishermen had enjoyed.

### Fewer Fishermen

Reduced income has reduced number of fishermen. This is not exceptional in an industrialized country where agriculture and fishing employ less of the work force. Among young fishermen on west coast, the industry center, 18% under 40 years switched in 1968 to other employment. For over 40, rate was 6%.

### Jellyfish Invasion

The invasion of jellyfish (medusa *Tima Bairdii*) in recent years has hit shrimp fishermen especially hard. During certain periods, the jellyfish have stopped shrimp fishing entirely. Trawls were quickly filled and became so heavy they split, or caused enormous workload in sorting out the shrimp. Swedish researchers claim that inflow of cold water from North Sea has caused invasion.

### Nordic Economic Union

The report and draft treaty covering fishery policy for Nordic economic union (NORDEK) has been criticized by National Fisheries Board and fishermen's organizations. The present proposal would abolish all restrictions on trade in fishery products between Nordic countries on Jan. 1, 1972. Authorities claim abrupt removal of restrictions

would seriously affect Swedish industry. They have proposed transition period of 5 years.

### Norwegian Subsidies & NORDEK

Another serious problem for Swedish fisheries is Norwegian subsidies to fishing industry. These have been increased yearly and now are estimated at 30% of catch value. The NORDEK report states national support should not affect trade competition between Nordic countries, or exports to a third country. However, the report states that support can be given fishermen to promote social, economic, and political objectives. Swedish fishing organizations claim this leaves open possibility of continuing subsidies and, to a large extent, eliminates basis for common fishery policy.

### Swedish Aid

Although Sweden is unwilling to subsidize fisheries, it provides some loans. From July 1, 1969, Swedish fishermen could apply for:

**Consolidation loans:** to assist fishermen with working capital problems, maximum 200,000 kronor, to be paid off during 10-year period.

**Rationalization loans:** to improve efficiency of fishing craft, maximum 200,000 kronor, 10-year period.

**Conversion loans:** aid to fishermen who have been continuously engaged in the industry during last 5 years and intend to take up another trade. Maximum 12,000 kronor, repayment required if recipients return to fishing within 2 years.

**Gear loans:** to assist fishermen who have lost gear, or whose gear has been damaged. Maximum: 15,000 kronor.

Other help will be given by 'Svensk Fisk.' It has started campaign to increase consumption of Swedish fish. It is responsible for setting guaranteed and minimum prices paid to fishermen and for making up difference when prices fall below these levels. Funds for these purposes previously came entirely from government. Since July 1, 1969, they have been obtained in large part from a fee of 3% of sales value of landed and imported cod, haddock, redfish, and saithe.

SWEDEN (Contd.):

OUTLOOK

The prospects for Swedish fisheries are not bright. The decline in number of fishermen probably will continue and could be accelerated if herring stocks decline further. Crew size will have to be cut to make fishing more profitable. There is a safety limit





however. The government has no plans for subsidies to maintain present size of fishing fleet.

Imports of fish and fish products are expected to remain relatively high in the future. This should offer sales opportunities, especially for U.S. shrimp and fresh frozen salmon. (U.S. Consul, Goteborg, Dec. 4, 1969.)



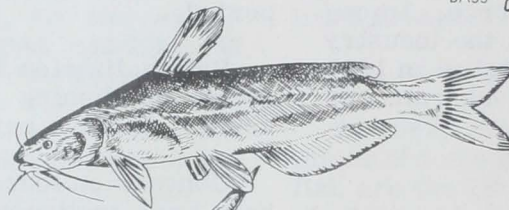
# AGE of FISH

"LIFE EXPECTANCY"

CARP		15 YEARS
BLACK BASS		8 YEARS
SUNFISH		6 YEARS
WHITE BASS		4 YEARS



GROWTH RATES OF FISH VARY—THE BETTER THE FOOD SUPPLY, THE BETTER THE GROWTH.



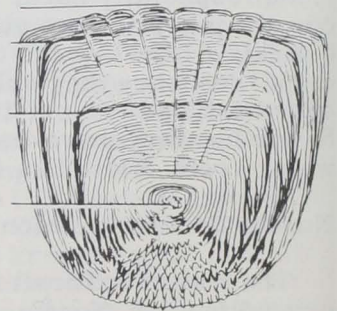
CATFISH CAN BE AGED BY TAKING SECTIONS OF THE FIN SPINES OR BACK-BONE AND MICROSCOPICALLY EXAMINING THEM.



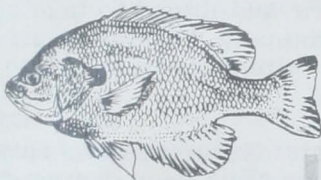
OUTER EDGE  
2nd ANNULUS  
OR YEAR  
MARK

1st ANNULUS

FOCUS OR  
CENTER



THIS SCALE WAS TAKEN FROM A BASS IN ITS THIRD YEAR. THE FISH WAS 16 INCHES LONG AND GREW ABOUT 8 INCHES ITS FIRST YEAR AND 6 INCHES DURING THE SECOND YEAR.



THESE BLUEGILLS ARE THE SAME AGE. THE TOP ONE WAS TAKEN FROM A WELL-MANAGED POPULATION, THE LOWER ONE FROM AN OVER-CROWDED FARM POND.



THE YEAR MARKS OR ANNULI ARE PROBABLY FORMED IN THE SPRING AS THE FISH BEGIN HEAVY FEEDING

# LATIN AMERICA

## CHILE

### SEEKS JAPANESE ADVICE ON SAURY FISHING

The Chilean Institute for the Study of Fishery Problems has asked guidance from a large firm in Japan on these aspects of the Japanese method of saury fishing: (1) converting anchovy purse seiners for saury fishing; (2) method of freezing and packing catch and (3) fish size used for tuna bait.

#### Plans Saury Fishery

Apparently, Chile plans to harvest the unexploited saury off her coast and export them as tuna bait to Japan, where bait saury is in short supply due to poor fishing.

The size of saury resource off Chile is estimated by FAO to be at least 50 million metric tons. ('Nihon Suisan Shimbun,' Nov. 7, 1969.)



## ECUADOR

### REPORT OF NEW SHRIMP BEDS IS PREMATURE

New information indicates that Oct. 1969 announcement of substantial new shrimp beds off Ecuador was overly optimistic.

The U.S. Consulate, Guayaquil, originally reported new beds 30 miles offshore in 40 to 100 fathoms and extending from Manta south. Catches up to 30,000 pounds for a single boat in 2 days fishing were reported.

#### Shrimp Disappeared

During late Sept.-early Oct. 1969, 90 vessels fished the new area and caught about 200,000 pounds. The shrimp disappeared after 3 weeks' fishing.

#### Good Year Nonetheless

Despite this failure, 1969 looked like a good shrimp year. The catch was up considerably over 1968. Exports for first 8 months were 6.2 million pounds, compared to 4.5 million pounds for 1968 period. According to industry sources, the reason for increased catch is better boats and more intense fishing. (U.S. Consulate, Guayaquil, Nov. 19, 1969.)

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## BRITISH HONDURAS

### FISHERY EXPORTS RISE

The reported value of British Honduras' 1968 fishery exports was US\$0.6 million, over 33% more than in 1967. Shipments continued high in 1969.

Exports of spiny lobster tail accounted for roughly two-thirds of the 1968 earnings. These exports now are being more accurately valued and will probably total more than US\$1 million annually.

#### Conch Exports Up

Conch exports are up substantially. With 543,000 lbs. shipped through August 1969, they were up more than 50% over first 8 months of 1968.

In the long run, however, major expansion can occur only in fin fish or in fish farming. These probably will require foreign capital and organization. (U.S. Consulate, Belize City, Oct. 31, 1969.)



## SOUTH PACIFIC

### AMERICAN SAMOA

#### TUNA PRICES INCREASED IN NOV. 1969

Japanese tuna suppliers and U.S. packers at American Samoa increased prices for November 1969 tuna deliveries to that island by US\$10 a ton for albacore, and \$5 a ton for yellowfin. This was the first price increase since August 1969.

The new prices represent an all-time high for American Samoa (per short ton): round albacore: frozen \$440, iced \$425; gilled-and-gutted yellowfin: frozen \$325.50, iced \$332.50.

#### Japanese Fleet Dwindles

Price negotiations are conducted monthly between Japanese firms and Samoa-based U.S. packers. But the size of Japanese tuna fleet supplying the island has dwindled to 5-6 vessels compared with 70-75 South Korean and 55-60 Taiwanese vessels. So indications are that from 1970 the three countries, alternately, will conduct price negotiations with U.S. packers. ('Katsuo-maguro Tsushin,' Nov. 20, 1969.)

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#### Plans Saury Fishery

Apparently, Chile plans to harvest the unexploited saury off her coast and export them as tuna bait to Japan, where bait saury is in short supply due to poor fishing.

The size of saury resource off Chile is estimated by FAO to be at least 50 million metric tons. ('Nihon Suisan Shimbun,' Nov. 7, 1969.)



## ECUADOR

### REPORT OF NEW SHRIMP BEDS IS PREMATURE

New information indicates that Oct. 1969 announcement of substantial new shrimp beds off Ecuador was overly optimistic.

The U.S. Consulate, Guayaquil, originally reported new beds 30 miles offshore in 40 to 100 fathoms and extending from Manta south. Catches up to 30,000 pounds for a single boat in 2 days fishing were reported.

#### Shrimp Disappeared

During late Sept.-early Oct. 1969, 90 vessels fished the new area and caught about 200,000 pounds. The shrimp disappeared after 3 weeks' fishing.

#### Good Year Nonetheless

Despite this failure, 1969 looked like a good shrimp year. The catch was up considerably over 1968. Exports for first 8 months were 6.2 million pounds, compared to 4.5 million pounds for 1968 period. According to industry sources, the reason for increased catch is better boats and more intense fishing. (U.S. Consulate, Guayaquil, Nov. 19, 1969.)

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## BRITISH HONDURAS

### FISHERY EXPORTS RISE

The reported value of British Honduras' 1968 fishery exports was US\$0.6 million, over 33% more than in 1967. Shipments continued high in 1969.

Exports of spiny lobster tail accounted for roughly two-thirds of the 1968 earnings. These exports now are being more accurately valued and will probably total more than US\$1 million annually.

#### Conch Exports Up

Conch exports are up substantially. With 543,000 lbs. shipped through August 1969, they were up more than 50% over first 8 months of 1968.

In the long run, however, major expansion can occur only in fin fish or in fish farming. These probably will require foreign capital and organization. (U.S. Consulate, Belize City, Oct. 31, 1969.)



## SOUTH PACIFIC

### AMERICAN SAMOA

#### TUNA PRICES INCREASED IN NOV. 1969

Japanese tuna suppliers and U.S. packers at American Samoa increased prices for November 1969 tuna deliveries to that island by US\$10 a ton for albacore, and \$5 a ton for yellowfin. This was the first price increase since August 1969.

The new prices represent an all-time high for American Samoa (per short ton): round albacore: frozen \$440, iced \$425; gilled-and-gutted yellowfin: frozen \$325.50, iced \$332.50.

#### Japanese Fleet Dwindles

Price negotiations are conducted monthly between Japanese firms and Samoa-based U.S. packers. But the size of Japanese tuna fleet supplying the island has dwindled to 5-6 vessels compared with 70-75 South Korean and 55-60 Taiwanese vessels. So indications are that from 1970 the three countries, alternately, will conduct price negotiations with U.S. packers. ('Katsuo-maguro Tsushin,' Nov. 20, 1969.)

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# ASIA

## JAPAN

### FISH SHORTAGE TO BECOME ACUTE

By 1977, fish supplies will be short about 2,000,000 metric tons in Japan, according to the Coastal Fishing Promotion Council. Reporting to the Fisheries Agency, the council said a price rise in marine products would be unavoidable, unless substantial innovations were made in fishing technology.

#### Demand Exceeds Supply

In 1968, Japan produced 8,600,000 tons of marine products, excluding about 700,000 tons of imports, but demand was substantially higher than supply. Demand for shrimp and tuna had risen conspicuously because of rising living standards.

#### Long-Range Forecast

Domestic per-capita consumption of fish is expected to grow from 122 pounds (whole or round weight) in 1967 to 148 pounds in 1977.

Demand for fish and marine products would increase to 12,400,000 tons by 1977, including about 800,000 tons of seaweed, the council forecast.

However, supplies will be limited to about 8,900,000 tons of fish and shellfish and to about 2,000,000 by imports. ('Yomiori,' Oct. 28, 1969.)

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### 1969 E. BERING SEA CRAB OUTPUT EXCEEDS PLANS

In 1969, Bristol Bay crab production surpassed original plans. The factoryships 'Keiko Maru' (7,536 gross tons) and 'Koyo Maru' (7,758 gross tons) ended operations in late Sept. Their combined quota was 85,000 cases of king crabs, and 16 million tanner crabs.

Keiko Maru reached her king crab quota, packing 43,400 cases. Her tanner crab quota was 8.2 million crabs plus an allowance; actually, catch reached 9 million crabs: 4,600 metric tons were frozen shell on, 2,700 tons were canned, and 7 tons frozen shell on.

#### Koyo Maru Catches Quota

Koyo Maru had been assigned a quota of 41,600 cases of king crabs and 7.8 million

tanner crabs plus an allowance. She packed her king crab quota and harvested 8.6 million tanner crabs (4,700 tons were frozen shell on and 10 tons shelled).

Both fleets experimented with shrink-packaging, using about 10% of the tanner crab catches. This method (heating and shrinking the meat before packaging) serves to increase the market value of tanner crab meat considerably. The factoryship owners are considering full-scale shrink-packaging of tanner crabs in 1970.

#### 1969 Fishing Appraised

Keiko Maru fleet's tanner-crab fishing gear was 60% tangle nets and 40% crab pots; Koyo Maru fleet used about 50% each.

Both fleet commanders said they would like to increase pot gear in 1970; fishing and sea conditions were different in 1969: the more productive grounds were found on the southwestern part of Bristol Bay.

They found king-crab fishing poor in late spring, but it began to improve toward fall. Tanner crabs were large and more abundant than anticipated. ('Suisan Keizai Shimbun,' Oct. 27, 1969.)

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### FISHERIES AGENCY EXPERIMENTS WITH PETROLEUM FISH FOOD

The Japanese Fisheries Agency is experimenting with production of synthetic petroleum protein as fish food. Projects are underway at 19 fishery experiment stations throughout Japan.

Petroleum protein is produced by micro-organic fermentation of liquid hydrocarbons. A solution of water, ammonia, dextrose, and other nutrients is seeded with pure cultures of yeast or bacteria. This mixture is introduced into a fermentation tank together with a paraffin feed-stock. Compressed air provides the necessary oxygen. The micro-organisms feed on the hydrocarbon molecules, converting them into living cells. These cells, harvested, dried and powdered, are the end product, usually referred to as single-cell protein (SCP).

#### High Growth Rates in Fish

In laboratory tests at stations in Nagano and Shizuoka prefectures, a compound of SCP

## JAPAN (Contd.)

and fish meal produced excellent results in raising eel, rainbow trout and, particularly, carp. At a marine fish farm, 20,000 rainbow trout, fed a formula of SCP (yeast grown on paraffin), fish meal, bean pulp, various minerals, and cuttlefish flesh, gained weight in a relatively short period.

### Mass Production of SCP

Judging from the remarkable results in preliminary experiments, the Agency believes that an annual production of 3,000,000 tons should be possible. This would equal about half the feed now imported. Coastal fishing enterprises, suffering from a feed shortage, would get a real 'shot in the arm' if this goal is achieved.

### Private Industry Begins Production

Many private companies already have done considerable research on SCP. Several plan to start production in 1970. Kyowa Hakko has produced several thousand tons in test runs. It plans to achieve an annual production rate of more than 100,000 metric tons before the end of 1970.

Kanegafuchi Chemical also plans to begin annual production of 60,000 tons by the end of 1970.

Dai Nippon Ink and Chemical has been making several tons a month and expects to produce 12,000 tons a month.

Mitsui Toatsu hopes to begin producing about 1,500 tons a year in mid-1970.

Ashahi Chemical and Ajinomoto also are experimenting with SCP. ('Youmuri,' July 18; 'Chemical Week,' August 2; 'Food Engineering,' May 1969; 'Fish Trades Gazette,' Aug. 16, 1969.)

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## EXPORTS MORE S. KOREAN & TAIWANESE TUNA

Tuna caught by South Korean and Taiwanese vessels and exported through Japanese trading firms during Jan.-Aug. 1969 were near 43,000 metric tons. This was reported by the Japanese Ministry of International Trade and Industry (MITI).

### Record in 1969 Possible

If exports continued at July-Aug. 1969 level (averaged around 6,000 tons), 1969 sales of foreign-caught tuna would easily surpass 1968's 61,000 tons.

Exports by area showed 34,563 short tons shipped to U.S. and Canada, and 11,442 metric tons to Italy, Spain, France, etc.

In addition to exports approved by MITI, foreign-caught tuna are sold directly by overseas-based Japanese firms and some is brought back to Japan for re-export. So the actual quantity of "third nation" tuna exports handled by Japanese firms are believed far greater than MITI's figures. ('Suisancho Nippo,' Oct. 23, 1969.)

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## MORE WHALE MEAT NEEDED

Japanese domestic sales of frozen whale meat have been so good that all 72,538 metric tons produced during the 23rd Antarctic whaling season were sold to dealers. The 5,000 tons imported from USSR were selling well. The 39,234 tons produced during the 18th North Pacific whaling season probably would be sold as soon as the carriers returned to Japan. Such a favorable market has not been experienced before. The cost of storing the meat was less in 1969 than before.

### Normal Supply Cycle

In the past, whaling companies did not exhaust the supply during the year. In the normal cycle, whale meat from the Antarctic landed in Japan February or March remained available until North Pacific whale meat appeared in the market in July or August. The supply of North Pacific whale meat lasted until appearance of whale meat from next Antarctic season. In 1969, however, all 3 whaling firms completed sales of Antarctic whale meat by end of April. By August all North Pacific whale meat had been sold.

### Selling Price Rises Yearly

The selling price to wholesalers has increased each year. In 1969, it was about 26 U.S. cents a pound. The favorable market is due partly to shortage caused by reduced international whaling quotas.

The demand for whale meat in 1970 will depend on the supply of fish and pork. However, demand is expected to increase. Then Japan would have to increase her imports of whale meat from the Soviet Union, South Africa, or Peru. These countries now see Japan as potential market. ('Suisancho Nippo,' Sept. 12, 1969.)

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## JAPAN (Contd.)

## U.S. FIRMS MAY BUY WHALE OIL

Two U.S. fat-and-oil processing firms recently sent representatives to Japan to buy sperm whale oil. Soviet-produced sperm oil is in short supply in Europe. The 2 firms are seeking a stable source in Japan.

## U.S. Demand

The U.S. representatives said a U.S. demand for 24,000-25,000 tons exists. They would like to obtain a stable supply of 15,000 to 18,000 tons from Japan--at cost, insurance, freight (c.i.f.) prices of around US\$180 a ton.

## European Market Improves

An agent for the British Unilever Company said in Japan that the fish and whale oil market in Europe was improving; U.S. menhaden oil was bringing about \$150 a ton. He guessed that the fin whale oil price was around £80 c.i.f. (about US\$191) a long ton. ('Suisan Tsushin,' Oct. 27, 1969.)

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## 3 FLEETS ARE WHALING IN ANTARCTIC

Three Japanese fleets began Antarctic whaling operations on Dec. 12, 1969. Japan has been assigned a national quota of 1,493 blue-whale units (BWUs) for the 1969/70 season.

The other active whaling nations, the USSR and Norway, have been assigned national quotas of 976 and 231 BWUs.

The overall quota--2,700 BWUs--set by the International Whaling Commission is 500 BWUs below 1968/69. ('Suisan Shuho,' Oct. 25, 1969.)

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## TRAWLS OFF NEW YORK

In first-half 1969, 10 Japanese trawlers fished off New York.

The 3 companies involved did not detail results. They agreed that "catches in the area off New York are slightly better than off Africa but the trip to and from Las Palmas is costly. From an economic point of view, therefore, the two areas will be of equal value."

## The Catch

The bulk of catch off New York was "yari-ika" (squid), "shizu" (butterfish), sea bream, herring, and hake. Price for squid, as high as US\$550 a metric ton, supports the fishery in that area.

The 3 firms consider the New York area part of year-round operation. They fish octopus off Africa in summer, and squid off New York in winter. Two other companies are planning to send trawlers to the New York grounds. ('Shin Suisan Shimbun,' Sept. 12, 1969.)

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## RESUMES EXPLORATORY FISHING IN NORTHEAST ATLANTIC

On April 15, 1969, Nichiro Gyogyo sent its stern trawler 'Akebono Maru No. 51' (1,454 gross tons) to Bay of Biscay and other northeast Atlantic areas on 3-month exploratory fishing trip. The firm planned a second survey of that region during December 1969-March 1970.

The first trip did not produce satisfactory results because of the unfavorable season.

## Second Survey

The vessel will begin in Bay of Biscay seeking 'monko' squid, octopus, and snapper. It will proceed toward Shetland Islands, north of Scotland, where herring fishing was reported promising. Nichiro's survey is supported by a government subsidy of about US\$222,000. ('Suisan Tsushin,' Nov. 19, 1969.)

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## JAPAN (Contd.)

7 SHRIMP FIRMS FORM COMPANY  
IN SOUTH AMERICA

On Nov. 19, 1969, 7 Japanese fishery firms fishing shrimp off Guianas in northeastern South America formed South America Northern Coast Fishery Development Co. The company has authorized capital of about US\$278,000 and paid-up capital of \$69,400 to be invested equally by all partners.

## To Invest in Plant

The firm plans to invest in shrimp-processing plant scheduled to be constructed in Georgetown, Guyana, by the British-owned Guyana Industry Holding Co. Plant will cost about \$2.5 million. It will have freezing capacity of 100 tons a day, and cold-storage capacity of 1,000 tons. The British firm reportedly invited also the participation of U.S. shrimp vessel owners in the region.

## Fleet Fishing Since 1963

Japanese firms have been fishing shrimp off Guianas since 1963. Their fleet consists of 69 shrimpers belonging to 7 firms: Nichiro, 24 vessels; Shinyo Gyogyo, 15; Yutaka Gyogyo, 10; Hokoku Suisan, Hakodate Kokai, Kagawa Godo Suisan, Nanbei Ebi Gyogyo--5 each.

Their catches, processed at shore plants in Georgetown, are either exported to U.S. or Japan. ('Minato Shimbun,' Nov. 23, 1969.)

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ANTARCTIC KRILL FISHERY  
IS CONSIDERED

The Japanese Fisheries Agency is studying use of euphausia (krill) found in limitless quantities in the Antarctic. Krill is similar to a small shrimp growing to five centimeters in 2 years. They are abundant near surface along the Antarctic ice pack and are regarded only as food for whales.

## Unlimited Stocks

Whale stocks have declined and so krill have increased explosively. The resource is estimated at 100 million metric tons with maximum sustainable yield of 500,000 tons. Because of limitless stocks, there will be no difficulty obtaining enough to process into food, but the problem lies in fishing method.

## The Problems

One company has offered to cooperate with the Agency in experimental fishing. They say "commercial fishing for euphausia will be difficult." Although the sea's red color ahead of vessel indicates abundance of plankton, only a few krill can be taken even with a large plankton net. The problem is that krill's swimming speed is faster than first thought. The surface and midwater trawls cannot be used.

Also, there are economic factors. It takes about one month to reach Antarctic ice pack from Japan via Pacific. ('Minato Shimbun,' Sept. 18, 1969.)

